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ABSTRACT

The Inventive Thinking Curriculum Project is one of the many projects included in the national outreach program of the U.S. Patent and Trademark Office. It is designed to be used in conjunction with a thinking skills program as a means of applying critical and creative thinking and problem-solving skills through the activity of creating an innovation or invention. This book contains activities that give children an opportunity to develop their creative potential and synthesize and apply knowledge and skills by creating an invention or innovation to solve a problem. Activities appropriate for all student populations include introducing inventive thinking, practicing the creative part of inventive thinking, practicing inventive thinking with the class, developing an invention idea, brainstorming for creative solutions, practicing the critical parts of inventive thinking, completing the invention, naming the invention, optional marketing activities, parent involvement, young inventors' day, and stories about great thinkers and inventors. (JRH)

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ED 406 232

THE INVENTIVE THINKING CURRICULUM PROJECT

An Outreach Program of The United States Patent and Trademark Office

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PROJECT XL

A Quest for Excellence

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THIRD EDITION

PATENT AND TRADEMARK OFFICE
UNITED STATES OF AMERICA

THE INVENTIVE THINKING CURRICULUM PROJECT

AN OUTREACH PROGRAM OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

PROJECT XL

A Quest for Excellence

THIRD EDITION

The activities featured in this project are appropriate for all student populations

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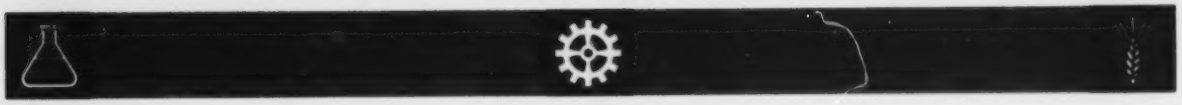

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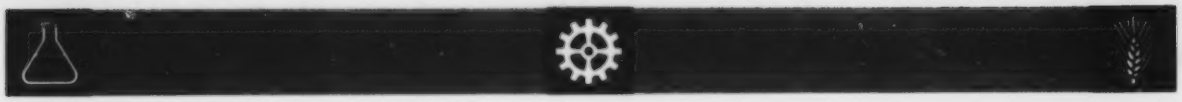
WELCOME TO THE INVENTIVE THINKING CURRICULUM PROJECT! I'M PROFESSOR G. RAY MATTER... AND I'LL BE YOUR GUIDE...
...TOGETHER, WE'LL HAVE AN EXCITING TIME LEARNING ABOUT CREATIVE AND CRITICAL THINKING, AND PROBLEM SOLVING!
WILLIAM COSTELLO



INTRODUCTION

Since the early 1980s, the U.S. Patent and Trademark Office has been working in concert with other Federal agencies, corporations, and associations to bring into national focus a number of grassroots school programs promoting thinking skills instruction. As a result of that effort, Project XL was initiated in 1985 as a national partnership designed to encourage proliferation of such programs and to develop new programs and materials which will promote critical and creative thinking and problem-solving skills for all children in our Nation's schools.

The INVENTIVE THINKING CURRICULUM PROJECT is one of the many projects included in this national outreach program. It should be used in conjunction with a thinking skills program as a means of applying critical and creative thinking and problem-solving skills through the activity of creating an innovation or invention.

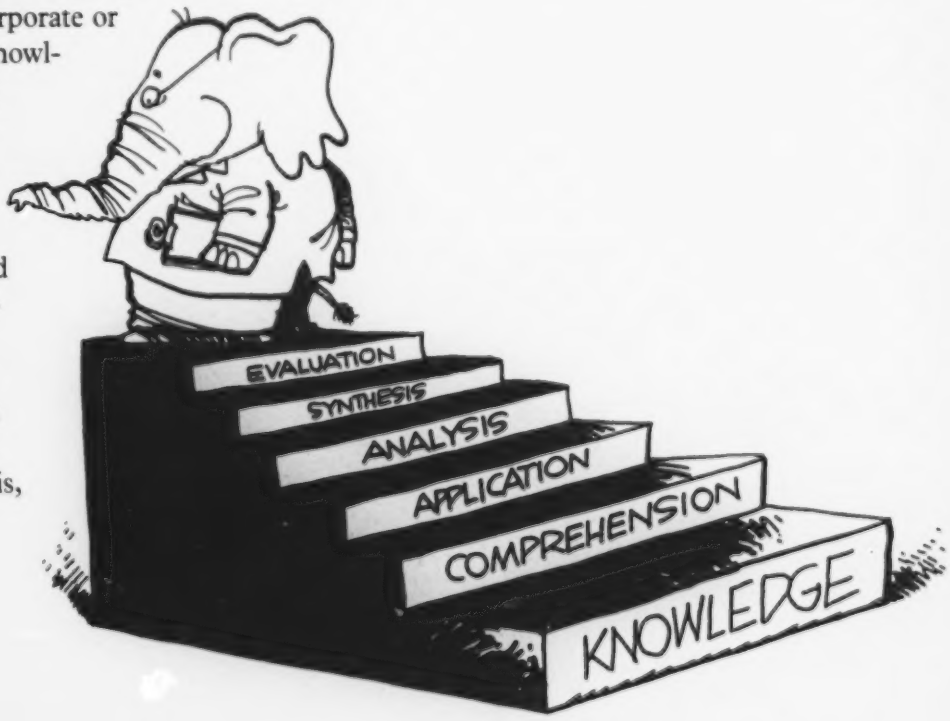
When a student is asked to "invent" a solution to a problem, the student must draw upon previous knowledge, skills, and experience. The student also recognizes areas where new learnings must be acquired in order to understand or address the problem. This information must then be applied, analyzed, synthesized, and evaluated. Through critical and creative thinking and problem-solving, ideas become reality as children create inventive solutions, illustrate their ideas, and make models of their inventions. The INVENTIVE THINKING CURRICULUM PROJECT provides children with opportunities to develop and practice higher-order thinking skills.

Throughout the years, many thinking skills models and programs have been generated from among America's finest educators, seeking to describe the essential elements of thinking and/or to develop a systematic approach to teaching thinking skills as part of the school curricula. Three such models/descriptions are illustrated in this introduction. Although each uses different terminology, each model describes similar elements of either critical or creative thinking, or both. A review of the models of BLOOM, TAYLOR, and ISAKSEN and TREFFINGER show how the INVENTIVE THINKING CURRICULUM PROJECT provides an opportunity for students to "experience" most of the elements described in these models.

Benjamin Bloom's Model

Perhaps most familiar to educators is "BLOOM'S taxonomy." Bloom describes the major areas in the cognitive domain. This information is drawn from the *Taxonomy of Educational Objectives, Handbook 1: Cognitive Domain* (1956). The taxonomy begins by defining KNOWLEDGE as the remembering of previously learned material. Knowledge, according to Bloom, represents the lowest level of learning outcomes in the cognitive domain. Knowledge is followed by COMPREHENSION, the ability to grasp the meaning of material and goes just beyond the knowledge level. Comprehension is the lowest level of understanding. APPLICATION is the next area in the hierarchy and refers to the ability to use learned material in new and concrete principles and theories. Application requires a higher level of understanding than comprehension.

In ANALYSIS, the next area of the taxonomy, the learning outcomes require an understanding of both the content and the structural form of material. Next is SYNTHESIS, which refers to the ability to put parts together to form a new whole. Learning outcomes at this level stress creative behaviors with a major emphasis on the formulation of new patterns or structures. The last level of the taxonomy is EVALUATION. Evaluation is concerned with the ability to judge the value of material for a given purpose. The judgments are to be based on definite criteria. Learning outcomes in this area are the highest in the cognitive hierarchy because they incorporate or contain elements of knowledge, comprehension, application, analysis, and synthesis. In addition, they contain conscious value judgments based on clearly defined criteria. The activity of inventing encourages the four highest levels of learning—application, analysis, synthesis, and evaluation—in addition to knowledge and comprehension.



Calvin Taylor's Model — Talents Unlimited

The second model is introduced by Calvin Taylor in Chapter XI and is discussed in a summary chapter by Carol Schlichter in Joseph Renzulli's book entitled *Systems and Models for Developing Programs for the Gifted and Talented* (1986). The Taylor model describes the talent areas as PRODUCTIVE THINKING, COMMUNICATION, PLANNING, DECISION MAKING, and FORECASTING. This work is best known as TALENTS UNLIMITED, a program of the National Diffusion Network of the U.S. Department of Education. The Taylor model incorporates both the critical and creative elements of thinking. Rather than a taxonomy, this is a thinking skills model that describes the essential elements of thinking, beginning with the academic talent and then incorporating the other talent areas, as described in more detail below.

PRODUCTIVE THINKING promotes creative thinking in the Taylor model. It suggests thinking of many ideas, varied ideas, unusual ideas, and adding to those ideas.

COMMUNICATION has six elements which include:

- give many, varied, single words to describe something;
- give many, varied, single words to describe feelings;
- think of many, varied things that are like another thing in a special way;
- let others know that you understand how they feel;
- make a network of ideas using many, varied and complete thoughts;
- tell your feelings and needs without using words.

PLANNING requires that students learn to tell:

- what they are going to plan;
- the materials that they will need;
- the steps that they will need to accomplish the task; and
- the problems that might occur.

DECISION MAKING teaches the student to:

- think of the many, varied things that could be done;
- think more carefully about each alternative;
- choose one alternative that they think is best; and
- give many, varied reasons for the choice.

FORECASTING is the last of the five talents and requires students to make many, varied predictions about a situation, examining cause and effect relationships. Every element of the TAYLOR model is used when a child invents.

Creative Problem Solving Model

The third model developed by Scott Isaksen and Donald Treffinger as described in the book *Creative Problem Solving: The Basic Course* (1985) by Isaksen and Treffinger and published in Buffalo, New York, by Bearly Limited, also describes both critical and creative thinking. CREATIVE THINKING is described as making and communicating connections to: think of many possibilities; think and experience in various ways and use different points of view; think of new and unusual possibilities; and guide in generating and selecting alternatives. CRITICAL THINKING is described as analyzing and developing possibilities to: compare and contrast many ideas; improve and refine ideas; make effective decisions and judgments; and provide a sound foundation for effective action. These definitions are used in a six-stage, problem-solving process. A brief description of each of the six stages follows:

1. Mess Finding: Just what's the mess that needs cleaning up, the situation that demands our attention? We have to identify and acknowledge this first before we can proceed.

2. Data Finding: Once the general mess is defined, the next stage involves "taking stock"—unearthing and collecting information, knowledge, facts, feelings, opinions, and thoughts to sort out and clarify your mess more specifically. What do you know about the situation, and what do you still need to know?

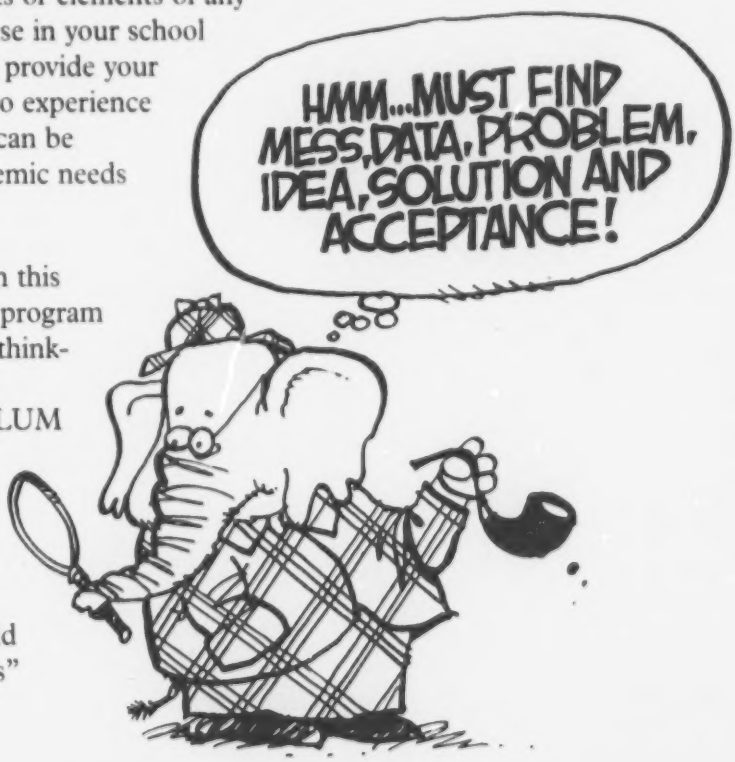
3. Problem Finding: Now that your data is collected, you need to formulate a "problem statement" that expresses the "heart" of the situation. You must try to put aside the common assumption that you "already know what the problem is" and try to state the problem in such a manner as to invite novel perspectives on it.

4. Idea Finding: This is the state in which you brainstorm as many ideas or alternatives as possible for dealing with your problem statement. Don't evaluate your ideas at this point, merely list them as an idea pool from which you'll draw in putting together a variety of solutions to your problem.

5. Solution Finding: Now that you have a number of ideas that can serve as possible solutions to your problem, it's time to evaluate them systematically. To do this you have to generate a variety of criteria and select the most important for your problem. Is it cost? expediency? pleasure? time involvement? etc. In this way, you'll be able to identify and evaluate the relative strengths and weaknesses of possible solutions.

6. Acceptance Finding: Having decided upon a solution, it's time to formulate a plan of action to implement your solution. Determine what kind of help you'll need, what obstacles or difficulties might get in the way, and what specific short- and long-term steps you are going to take to rid yourself of that original mess!

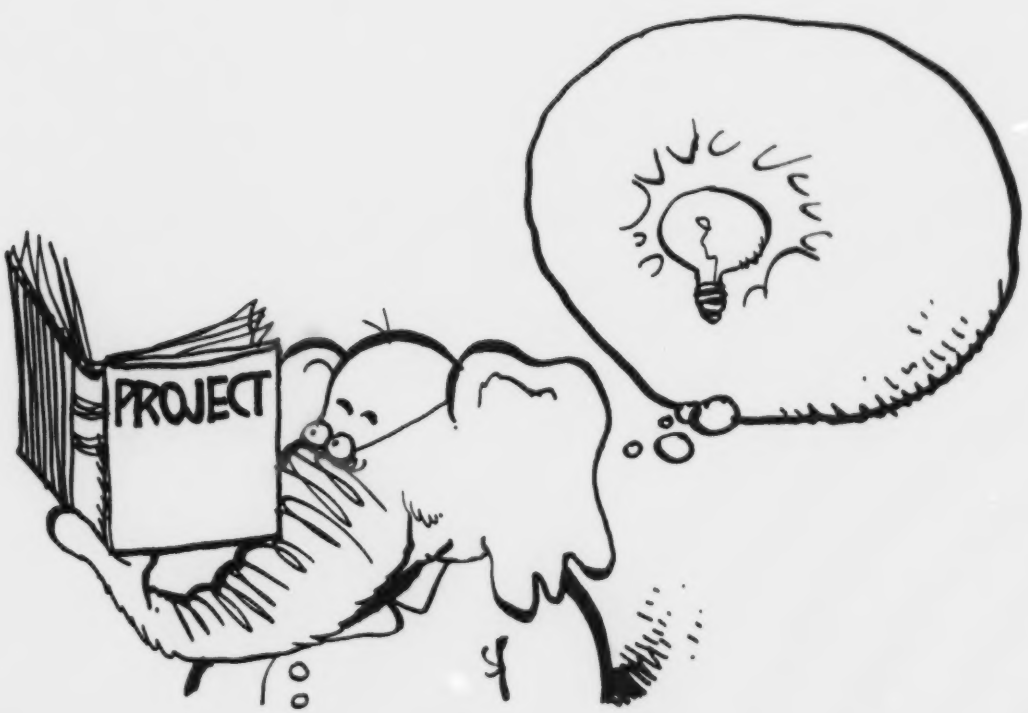
Now that you have reviewed these examples, you will see the critical and creative thinking and problem-solving skills and talents that can be applied through the activity of inventing. The INVENTIVE THINKING CURRICULUM PROJECT that follows can be used across all disciplines and grade levels and with all children. It can be integrated with all curricular areas and used as a means of applying the concepts or elements of any thinking skills program that may be in use in your school district. Participation in this project will provide your students with an excellent opportunity to experience the highest levels of thinking. Activities can be adapted to the developmental and academic needs of the class.



We hope that you will join Project XL in this national effort, by developing your own program for promoting the teaching of inventive thinking and problem-solving skills. Use the INVENTIVE THINKING CURRICULUM PROJECT as a springboard for capturing the imagination, interest, and creativity that each of us has within our reach. The children of this Nation are our very best investment in tomorrow. Our future will be brighter if we add a big "T" for thinking to the basic 3 "Rs" of the school curricula.

A special project that provides a unique opportunity for children of all ages to develop their problem-solving and inventive thinking skills in an integrated learning activity can be implemented at your school. Just use the procedures, activities, and guidelines in this booklet to create your own exciting program.

Children of all ages are talented and creative. This project will give them an opportunity to develop their creative potential and synthesize and apply knowledge and skills by creating an invention or innovation to solve a problem, just as a "real" inventor would.



ACTIVITIES

PROJECT XL

A Quest for Excellence

INVENTIVE
THINKING

Activity #1

INTRODUCING INVENTIVE THINKING

"Imagination is more important than knowledge, for imagination embraces the world."
Albert Einstein

1. Read the stories in the back of this guide (p. 27)or copy them for the students to read themselves. Ask students, "How did these inventors get their ideas? How did they make their ideas a reality?" Locate books in your library about inventors, invention, and creativity. Older students can locate these references themselves.

2. Invite a local inventor to speak to the class. Since local inventors are not usually listed in the phone book, you can find them by calling a local patent attorney or your local intellectual property law association. Your community may also have a Patent and Trademark Depository Library or an inventor's society that you may contact. If not, most of your major companies have a research and development department made up of people who think inventively for a living.

3. Next, ask the students to look at the things in the classroom that are inventions. All the inventions in the classroom that have a U.S. patent will have a patent number. One such item is probably the pencil sharpener. Tell them to check out their house for patented items. Let the students list all of the inventions they discover. What would improve these inventions?

4. In order to guide your students through the inventive process, a few preliminary lessons dealing with creative thinking will help set the mood. Begin with a brief explanation of brainstorming and a discussion on the rules of brainstorming (see p. 10).

Brainstorming

Brainstorming is a process of spontaneous thinking used by an individual or by a group of people to generate numerous alternative ideas while deferring judgment. Introduced by Alex Osborn in his book *Applied Imagination,* brainstorming is the crux of each of the stages of all problem-solving methods.

RULES FOR BRAINSTORMING

NO CRITICISM ALLOWED. People tend to automatically evaluate each suggested idea—their own as well as others. Both internal and external criticism are to be avoided while brainstorming. Neither positive nor negative comments are allowed. Either type inhibits the free flow of thought and requires time which interferes with the next rule. Write each spoken idea down as it is given and move on.

WORK FOR QUANTITY. Alex Osborn stated that "Quantity breeds quality." People must experience a "braindrain" (get all the common responses out of the way) before the innovative, creative ideas can surface; therefore, the more ideas, the more likely they are to be quality ideas.

HITCHHIKING WELCOME. Hitchhiking occurs when one member's idea produces a similar idea or an enhanced idea in another member. All ideas should be recorded.

FREEWHEELING ENCOURAGED. Outrageous, humorous, and seemingly unimportant ideas should be recorded. It is not uncommon for the most off-the-wall comment to be one wherein lies the solution for the problem.

Activity #2

PRACTICING THE CREATIVE PART OF INVENTIVE THINKING

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1. Cultivate the following creative thinking processes described by Paul Torrance and discussed in *The Search for Satori and Creativity* (1979).

FLUENCY . . . . . .the production of a great number of ideas.

FLEXIBILITY . . . . .the production of ideas or products that show a variety of possibilities or realms of thought.

ORIGINALITY . . . . .the production of ideas that are unique or unusual.

ELABORATION . . . .the production of ideas that display intensive detail or enrichment.

For practice in elaboration, have pairs or small groups of students choose a particular idea from the brainstorming list and add the flourishes and details that would develop the idea more fully.

Allow the students to share their innovative and inventive ideas!

2. Once your students have become familiar with the rules of brainstorming and the creative thinking processes, Bob Eberle's SCAMPER technique for brainstorming could be introduced.

SUBSTITUTE . . . . . What else instead? Who else instead? Other ingredients? Other material? Other power? Other place?

COMBINE . . . . . How about a blend, an alloy, an ensemble? Combine purposes? Combine appeals?

ADAPT . . . . . What else is like this? What other idea does this suggest? Does past offer parallel? What could I copy?

MINIFY . . . . . Order, form, shape? What to add? More time?

MAGNIFY . . . . . Greater frequency? Higher? Longer? Thicker?

PUT TO OTHER USES . . New ways to use as is? Other uses I modified? Other places to use? Other people to reach?

ELIMINATE . . . . . What to subtract? Smaller? Condensed? Miniature? Lower? Shorter? Lighter? Omit? Streamline? Understate?

REVERSE . . . . . Interchange components? Other pattern?

REARRANGE . . . . . .Other layout? Other sequence? Transpose cause and effect? Change pace? Transpose positive and negative? How about opposites? Turn it backward? Turn it upside-down? Reverse roles?

3. Bring in any object or use objects around the classroom to do the following exercise. Ask the students to list many new uses for a familiar object by using the SCAMPER technique with regard to the object. You could use a paper plate to begin with, and see how many new things the students will discover. Make sure to follow the rules for brainstorming in Activity #1.

4. Using literature, ask your students to create a new ending to a story, change a character or situation within a story, or create a new beginning for the story that would result in the same ending.

5. Put a list of objects on the chalkboard. Ask your students to combine them in different ways to create a new product.

Let the students make their own list of objects. Once they combine several of them, ask them to illustrate the new product and explain why it might be useful.

Activity #3

PRACTICING INVENTIVE THINKING WITH THE CLASS

Before your students begin to find their own problems and create unique inventions or innovations to solve them, you can assist them by taking them through some of the steps as a group.

1. Finding the Problem. Let the class list problems in their own classroom that need solving. Use the "brainstorming" technique from Activity #1. Perhaps your students never have a pencil ready, as it is either missing or broken when it is time to do an assignment. Select one problem for the class to solve using the following steps:

a. Find several problems. Select one to work on.

b. Analyze the situation.

c. Think of many, varied, and unusual ways of solving the problem.

List the possibilities. Be sure to allow even the silliest possible solution, as creative thinking must have a positive, accepting environment in order to flourish.

2. Finding a Solution.

a. Select one or more possible solutions to work on. You may want to divide into groups if the class elects to work on several of the ideas.

b. Improve and refine the idea(s).

c. Share the class or individual solution(s)/invention(s) for solving the class problem.

Solving a "class" problem and creating a "class" invention will help students learn the process and make it easier for them to work on their own invention projects.

Activity #4

DEVELOPING AN INVENTION IDEA

Now that your students have had an introduction to the inventive process, it is time for them to find a problem and create their own invention to solve it.

1. Begin by asking your students to conduct a survey. Tell them to interview everyone that they can think of to find out what problems need solutions. What kind of invention, tool, game, device, or idea would be helpful at home, work, or during leisure time? (see p. 39)

2. Ask the students to list the problems that need to be solved.

3. Next comes the decision-making process. Using the list of problems, ask the students to think of which problems would be possible for them to work on. They can do this by listing the pros and cons for each possibility. Predict the outcome or possible solution(s) for each problem. Make a decision by selecting one or two problems that provide the best options for an inventive solution. (Duplicate the Planning and Decision-Making Framework p. 41)

4. Begin an Inventor's Log or Journal. A record of your ideas and work will help you develop your invention and protect it when completed. (Sample log sheet on p. 51.)

RULES FOR AUTHENTIC JOURNAL KEEPING

- ✔ Using a bound notebook, make notes each day about the things you do and learn while working on your invention.
- ✔ Record your idea and how you got it.
- ✔ Write about problems you have and how you solve them.
- ✔ Write in ink and do not erase.
- ✔ Add sketches and drawings to make things clear.
- ✔ List all parts, sources, and costs of materials.
- ✔ Sign and date all entries at the time they are made and have them witnessed.

5. To illustrate why record-keeping is important, read the following story about Daniel Drawbaugh who said that he invented the telephone, but didn't have one single paper or record to prove it.

   Long before Alexander Graham Bell filed a patent application in 1875, Daniel Drawbaugh claimed to have invented the telephone. But since he had no journal or record, the Supreme Court rejected his claims by four votes to three. Alexander Graham Bell had excellent records and was awarded the patent for the telephone.

Activity #5

BRAINSTORMING FOR CREATIVE SOLUTIONS

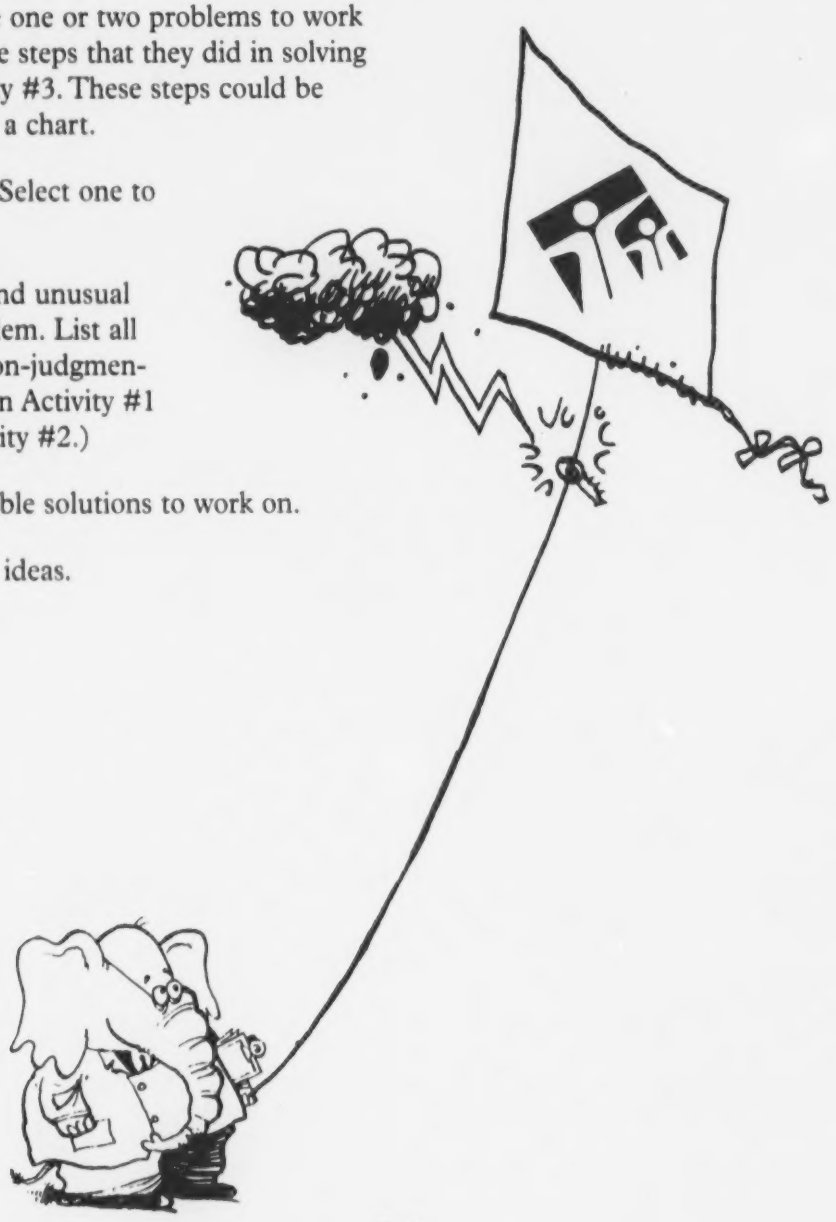
Now that the students have one or two problems to work on, they must take the same steps that they did in solving the class problem in Activity #3. These steps could be listed on the chalkboard or a chart.

1. Analyze the problem(s). Select one to work on.

2. Think of many, varied, and unusual ways of solving the problem. List all of the possibilities. Be non-judgmental. (See Brainstorming in Activity #1 and SCAMPER in Activity #2.)

3. Select one or more possible solutions to work on.

4. Improve and refine your ideas.



Activity #6

PRACTICING THE CRITICAL PARTS OF INVENTIVE THINKING

Now that your students have some exciting possibilities for their invention projects, they will need to use their critical thinking skills to narrow down the possible solutions. They can do this by asking themselves the following questions about their inventive idea:

1. Is my idea practical?
2. Can it be made easily?
3. Is it as simple as possible?
4. Is it safe?
5. Will it cost too much to make or use?
6. Is my idea really new?
7. Will it withstand use, or will it break easily?
8. Is my idea similar to something else?
9. Will people really use my invention? (Survey your classmates or the people in your neighborhood to document the need or usefulness of your idea.)

Activity #7

COMPLETING THE INVENTION

When students have an idea that meets most of the above qualifications, they need to plan how they are going to complete their project. The following planning technique will save them a great deal of time and effort:

1. Identify the problem and possible solution. Give your invention a name.

2. List the materials needed to illustrate your invention and to make a model of it. You will need paper, pencil, and crayons or markers to draw your invention. You might use cardboard, paper, clay, wood, plastic, yarn, paper clips, and so forth to make a model. You might also want to use an art book or a book on model-making from your school library.

3. List, in order, the steps for completing your invention.

4. Think of the possible problems that might occur. How would you solve them?

5. Complete your invention. Ask your parents and teacher to help with the model.

REMEMBER!

- **WHAT** - describe the problem
- **MATERIALS** - list the materials needed
- **STEPS** - list the steps to complete your invention
- **PROBLEMS** - predict the problems that could occur.

Activity #8

NAMING THE INVENTION

An invention can be named in one of the following ways:

1. Using the inventor's name

   - Levi Strauss = LEVI'S® jeans
   - Louis Braille = Braille Alphabet System

2. Using the components or ingredients of the invention

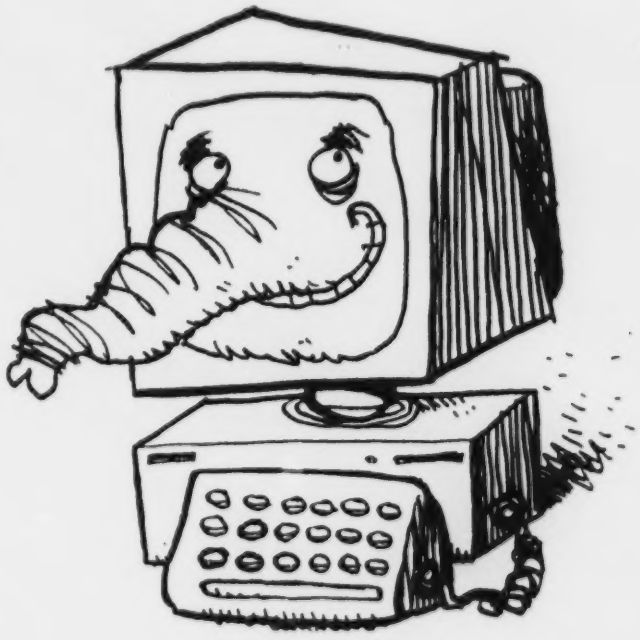
   - Root Beer
   - Peanut Butter

3. With initials or acronyms

   - IBM®
   - S.C.U.B.A.®

4. Using word combinations (notice repeated consonant sounds and rhyming words).

   - KIT KAT®
   - HULA HOOP®
   - PUDDING POPS®
   - CAP'N CRUNCH®



5. Using the product's function

- SUPERSEAL®
- DUSTBUSTER®
- vacuum cleaner
- hairbrush
- earmuffs

Students can be very fluent when it comes to listing ingenious names of products out on the market. Solicit their suggestions and have them explain what makes each name effective. Each student should generate names for his/her own invention.

Activity #9

OPTIONAL MARKETING ACTIVITIES

1. Developing a slogan or jingle

Have the students define the terms "slogan" and "jingle." Discuss the purpose of having a slogan.

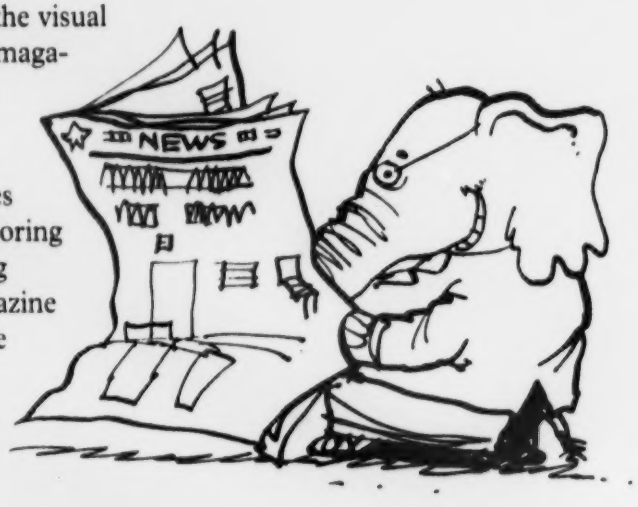
Sample slogans and jingles:

"Things go better with Coke."
"COKE IS IT!®"
"TRIX ARE FOR KIDS®"
"OH THANK HEAVEN FOR 7-ELEVEN®"
"TWOALLBEEFPATTIES..."
"GE: WE BRING GOOD THINGS TO LIFE!®"

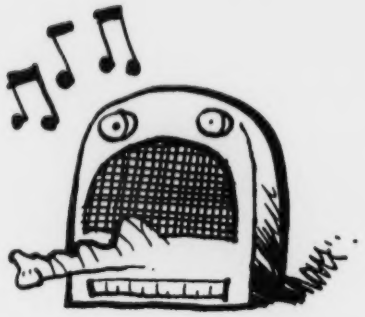
Your students will be able to recall many slogans and jingles! When a slogan is named, discuss the reasons for its effectiveness. Allow time for thought in which the students can create jingles for their inventions.

2. CREATING AN ADVERTISEMENT

For a crash course in advertising, discuss the visual effect created by a television commercial, magazine, or newspaper advertisement. Collect magazine or newspaper ads that are eye-catching—some of the ads might be dominated by words and others by pictures that "say it all." Students might enjoy exploring newspapers and magazines for outstanding advertisements. Have students create magazine ads to promote their inventions. (For more advanced students, further lessons on advertising techniques would be appropriate at this point.)



3. RECORDING A RADIO PROMO



A radio promo could be the icing on a student's advertising campaign! A promo might include facts about the usefulness of the invention, a clever jingle or song, sound effects, humor... the possibilities are endless. Students may choose to tape record their promos for use during the Invention Convention.

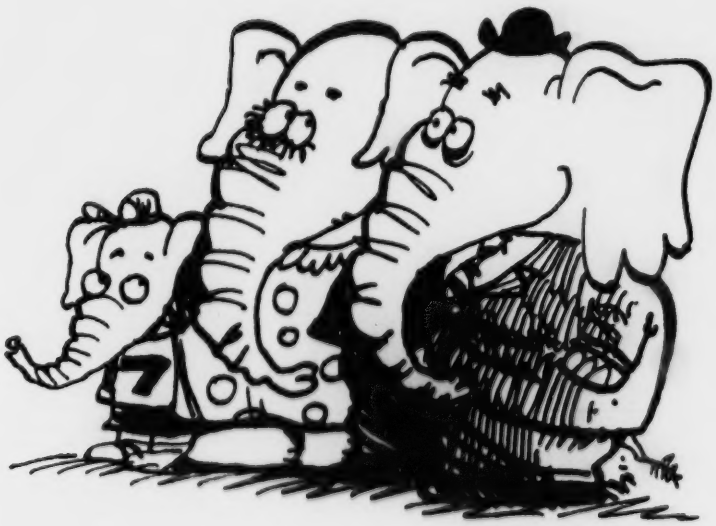
4. ADVERTISING ACTIVITY

Collect 5 - 6 objects and give them new uses. For instance, a toy hoop could be a waist reducer, and some strange looking kitchen gadget might be a new type of mosquito catcher. Use your imagination! Search everywhere—from the tools in the garage to the kitchen drawer—for fun objects. Divide the class into small groups, and give each group one of the objects to work with. The group is to give the object a catchy name, write a slogan, draw an ad, and record a radio promo. Stand back and watch the creative juices flow. Variation: Collect magazine ads and have the students create new advertising campaigns using a different marketing angle.

Activity #10

PARENT INVOLVEMENT

Few, if any, projects are successful unless the child is encouraged by the parents and other caring adults. Once the children have developed their own, original ideas, they should discuss them with their parents. Together, they can work to make the child's idea come to life by making a model. Although the making of a model is not necessary, it makes the project more interesting and adds another dimension to the project. You can involve parents by simply sending a letter home to explain the project and let them know how they may participate. One of your parents may have invented something that they can share with the class. (See sample parent letter on p. 45.)



Activity #11

YOUNG INVENTORS' DAY

Plan a Young Inventors' Day so that your students can be recognized for their inventive thinking. This day should provide opportunities for the children to display their inventions and tell the story of how they got their idea and how it works. They can share with other students, their parents, and others.

When a child successfully completes a task, it is important that (s)he be recognized for the effort. All children who participate in the Inventive Thinking Curriculum Project are winners.

The U.S. Patent and Trademark Office has prepared a certificate that can be copied and given to all children who participate and use their inventive thinking skills to create an invention or innovation. This award, signed by the Assistant Secretary of Commerce and Commissioner of Patents and Trademarks, is included on page 47.

Activity #12

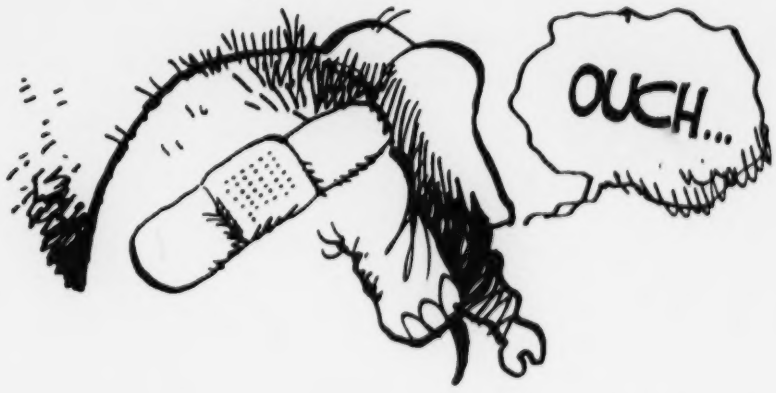
ENRICHMENT

The following stories about great thinkers and inventors will help to motivate your students and enhance their appreciation of the contributions of inventors to the American way of life.

As students read these stories, they will also realize the "inventors" are male, female, old, young, minority, and majority. They are ordinary people who follow through with their creative ideas to make their dreams a reality.

1. GREAT THINKERS AND THEIR INVENTIONS

Earmuffs "Baby, Its Cold Outside" may have been the song running through 13 year old Chester Greenwood's head one cold December day in 1873. To protect his ears while ice skating, he found a piece of wire, and with his grandmother's help, padded the ends. In the beginning, his friends laughed at him. However, when they realized that he was able to stay outside skating long after they had gone inside freezing, they stopped laughing. Instead, they began to ask Chester to make ear covers for them, too. At age 17 Chester applied for a patent. For the next 60 years, Chester's factory made earmuffs, and earmuffs made Chester rich!



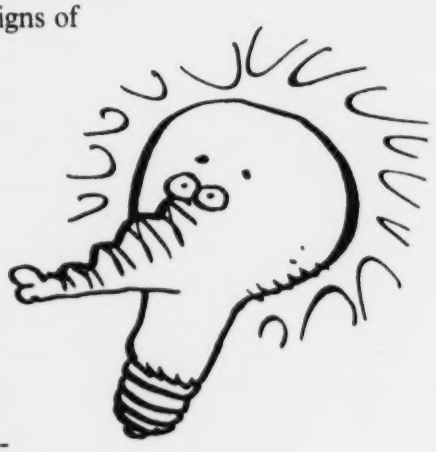
BAND-AID® At the turn of the century, Mrs. Earl Dickson, an inexperienced cook, often burned and cut herself. Mr. Dickson, a Johnson and Johnson employee, got plenty of practice in hand bandaging! Out of concern for his wife's safety, he began to prepare bandages ahead of time so that his wife could apply them by herself. By combining a piece of surgical tape and a piece of gauze, he fashioned the first crude adhesive strip bandage!

LIFE-SAVERS® Candy During the hot summer of 1913, Clarence Crane, a chocolate candy manufacturer, found himself facing a dilemma. When he tried to ship his chocolates to candy shops in other cities they melted into gooey blobs. To avoid dealing with the "mess," his customers were deferring their orders until cool weather. In order to retain his customers, Mr. Crane needed to find a substitute for the melted chocolates. He experimented with hard candy which wouldn't melt during shipment. Using a machine designed for making medicine pills, Crane produced small, circular candies with a hole in the middle. The birth of LIFE SAVERS!

FRISBEE® The term FRISBEE did not always refer to the familiar plastic disks we visualize flying through the air. Long ago (over 100 years ago), in Bridgeport, Connecticut, William Russell Frisbie owned the Frisbie Pie Company and delivered his pies locally. All of his pies were baked in the same type of 10" round tin with a raised edge, wide brim, six small holes in the bottom, and "Frisbie Pies" on the bottom. Playing catch with the tins soon became a popular local sport. However, the tins were slightly dangerous when a toss was missed. It became the Yale custom to yell "Frisbie" when throwing a pie tin. In the 40's when plastic emerged, the pie-tin game was recognized as a manufacturable and marketable product. (Note: FRISBEE® is a registered trademark of Wham-O Mfg. Co.)

2. THOMAS EDISON AND OTHER YOUNG INVENTORS

If I were to tell you that **Thomas Alva Edison** had shown signs of inventive genius at an early age, you probably would not be surprised. Mr. Edison achieved enormous fame with his lifelong contributions of volumes of inventive technology. He received the first of his 1,093 U.S. patents by age 22. In the book, *Fire of Genius*, Ernest Heyn reported on a remarkable resourceful young Edison—though some of his earliest tinkering clearly lacked merit.



By the age of six, Thomas Edison's experiments with fire were said to have cost his father a barn. Soon after that, it is reported that young Edison tried to launch the first human balloon by persuading another youth to swallow large quantities of effervescing powders to inflate himself with gas. Of course, the experiments brought quite unexpected results!

Chemistry and electricity held great fascination for this child, Thomas Edison. By his early teens, he had designed and perfected his first real invention, an electrical cockroach control system. He glued parallel strips of tinfoil to a wall and wired the strips to the poles of a powerful battery—quite a shock for the unsuspecting insect.

As a dynamo of creativity, Mr. Edison stood as decidedly unique; but as a child with a curious, problem-solving nature, he was not alone. Here are some more "inventive children" we grew to know and appreciate:

- At age 14, one schoolboy invented a rotary brush device to remove husks from wheat in the flour mill run by his friend's father. The young inventor's name? Alexander Graham Bell.

- At 16, another of our junior achievers saved pennies to buy materials for his chemistry experiments. While still a teenager, he set his mind on developing a commercially viable aluminum refining process. By age 25, Charles Hall received a patent on his revolutionary electrolytic process.

- While only 19 years old, another imaginative young person designed and built his first helicopter. In the summer of 1909, it very nearly flew. Years later, Igor Sikorsky perfected his design and saw his early dreams change aviation history. Silorsky was inducted into the National Inventors Hall of Fame in 1987.

Scores of childhood problem-solvers abound. Perhaps you've heard about:

- **Samuel Colt's** childhood experience with underwater explosives;
- Fourteen-year-old **Robert Fulton's** manually operated paddlewheel; and
- **Guglielmo Marconi's** early mechanical/electrical tinkering.

Even the father of television, **Philo T. Farnsworth,** conceived his optical scanning idea at the tender age of 14.

3. GREAT WOMEN INVENTORS

Inventions tell something about the inventor's place in the society in which (s)he lives, a closeness to certain kinds of problems, and possession of certain skills. It is not surprising that up until the mid 20th Century, women's inventions were often related to childcare, housework, and healthcare, all traditional female occupations. In recent years, with access to specialized training and broader job opportunities, women are applying their creativity to many new kinds of problems, including those requiring high technology.While women have frequently come up with new ways to make their work easier, they have not always received credit for their ideas. Some stories about early women inventors show that women often recognized that they were entering "a man's world," and shielded their work from the public eye by allowing men to patent their inventions.

- Although Eli Whitney received a patent for a cotton gin, **Catherine Greene** is said to have posed both the problem and the basic idea to Whitney. Furthermore, according to Matilda Gage, (*Women as Inventor,* 1883), his first model, fitted with wooden teeth, did not do the work well, and Whitney was about to throw the work aside, when Mrs. Greene proposed the substitution of wire to catch the cotton seeds.

OTHER WOMEN INVENTORS AND THEIR DISCOVERIES

- **Margaret Knight,** remembered as "the female Edison," received some 26 patents for such diverse items as a window frame and sash, machinery for cutting shoe soles, and improvements to internal combustion engines. Her most significant patent was for machinery that would automatically fold and glue paper bags to create square bottoms, an invention which dramatically changed shopping habits. Workmen reportedly refused her advice when first installing the equipment because, "after all, what does a woman know about machines?"

- **Sarah Breedlove Walker,** the daughter of former slaves, was orphaned at seven and widowed by 20. Madame Walker is credited with inventing hair lotions, creams, and an improved hair styling hot comb. But her greatest achievement may be the development of the Walker System, which included a broad offering of cosmetics, licensed Walker Agents, and Walker Schools, which offered meaningful employment and personal growth to thousands of Walker Agents, mostly Black women. Sarah Walker was the first American woman self-made millionaire.

- **Bette Graham** hoped to be an artist, but circumstances led her into secretarial work. Bette, however, was not an accurate typist. Fortunately, she recalled that artists could correct their mistakes by painting over them with gesso, so she invented a quick drying "paint" to cover her typing mistakes. Bette first prepared the secret formula in her kitchen using a hand mixer, and her young son helped to pour the mixture into little bottles. In 1980, the Liquid Paper Corporation, which Bette Graham built, was sold for over $47 million.

- **Ann Moore,** a Peace Corps volunteer, saw how African women carried babies on their backs by tying cloth around their bodies, leaving both hands free for other work. When she returned to the United States, she designed a carrier which became the popular SNUGLI. Recently Ms. Moore received another patent for a carrier to conveniently transport oxygen cylinders. People needing oxygen for breathing assistance, who were previously confined to stationary oxygen tanks, can now move about more freely. Her company now sells several versions including lightweight backpacks, handbags, shoulder bags, and wheelchair/walker carriers for portable cylinders.

- **Stephanie Kwolek,** one of Dupont's leading chemists, discovered the "miracle fiber," Kevlar, which has five times the strength of steel by weight. Uses for Kevlar are seemingly endless, including ropes and cables for oil drilling rigs, canoe hulls, boat sails, automobile bodies and tires, and military and motorcycle helmets. Many Viet Nam veterans and police officers are alive today because of protection provided by bullet-proof vests made from Kevlar. Because of its strength and lightness, Kevlar was chosen as the material for the Gossamer Albatross, a pedal airplane flown across the English Channel. Kwolek was inducted into the National Inventors Hall of Fame in 1995.

- **Gertrude B. Elion,** 1988 Nobel laureate in Medicine, and Scientist Emeritus with Burroughs Wellcome Company, is credited with the synthesis of two of the first successful drugs for Leukemia, as well as Imuron, an agent to prevent the rejection of kidney transplants, and Zovirax, the first selective antiviral agent against herpes virus infections. Researchers who discovered AZT, a breakthrough treatment for AIDS, used Elion's protocols. Elion was inducted into the National Inventors Hall of Fame in 1991, the first woman inductee.

Did you know

- windshield wipers were patented by **Mary Anderson** in 1903?
- dandruff shampoo was patented by **Josie Stuart** in 1903?
- a dishwasher was patented by **Josephine Cochrane** in 1914?
- the first disposable diaper was patented by **Marion Donovan** in 1951?
- a compact portable hair dryer was patented by **Harriet J. Stern** in 1962?
- a dough product for frozen pizza was patented by **Rose Totino** in 1979?
- the Melitta Automatic Drip Coffee Maker was patented by **Melitta Benz** in Germany in 1908?

Note: Much of the material in this section was drawn from the Minnesota Historical Society Exhibit, "Her Works Praise Her, Inventions by Women." For further information on women inventors, you may contact the Minnesota Historical Society's Traveling Exhibition Department at 612/297-4497.

4. GREAT MINORITY INVENTORS

Between 1863 and 1913, approximately 1,200 inventions were patented by Black inventors. Many more were unidentified because they hid their race to avoid discrimination. Some sold their inventions to White men. The following stories are about a few of the great minority inventors.

- **Elijah McCoy.** Have you ever heard of the term "real McCoy?" That term may apply to a famous Black inventor by the name of Elijah McCoy. He earned about 50 patents, but the most famous one was for a metal or glass cup that fed oil to bearings through a small-bore tube. Machinists and engineers who wanted genuine McCoy lubricators may have originated the term "the real McCoy." Elijah McCoy was born in Ontario, Canada, in 1843, the son of slaves who had fled Kentucky. He died in Michigan in 1929.

- **Benjamin Banneker.** Benjamin Banneker created the first striking clock made of wood in America. He became known as the "Afro-American Astronomer." He published an almanac and with his knowledge of mathematics and astronomy, he assisted in the surveying and planning of the new city of Washington, D.C.

- **Granville Woods** had more than 60 patents. Known as the "Black Edison," he improved Bell's telegraph and created an electrical motor that made the underground subway possible. He also improved the airbrake.

- **Garrett Morgan** invented the traffic signal that saved thousands of lives when the automobile became popular. He also invented a safety hood for firefighters.

■ **George Washington Carver** changed the South with his many inventions. He discovered over 300 different products made from the peanut which, until Carver, was considered a lowly food fit for hogs. He dedicated himself to teaching others, learning and working with nature. He created over 125 new products with the sweet potato and taught poor farmers how to rotate crops to improve their soil and their cotton. George Washington Carver was a great scientist and inventor who learned to be a careful observer and who was honored throughout the world for his creation of new things.

Read more about inventors and their discoveries at your local library.

COPYMASTERS

PROJECT XL

A Quest for Excellence

INVENTION IDEA SURVEY

PROJECT XL
A Quest for Excellence

One of the best ways to collect ideas for developing an innovation or invention is to take a survey. Make sure to survey a variety of people of all different ages and occupations. The more people you talk to, the more ideas you will get. The following list of questions may help you:

1. What does not work as well as you would like it to work?

2. What job(s) would you like to see solved?

3. What problem(s) would you like to see solved?

4. If you could invent something to make your life easier, what would you invent?

5. What is the most annoying problem

at home? _____

at school? _____

at work? _____

at the airport? _____

on the road? _____

at the supermarket? _____

at the bank? _____

at the shopping center? _____

at the _____? _____

PLANNING AND DECISION-MAKING FRAMEWORK

PROJECT XL
A Quest for Excellence

PROBLEM - What is the dilemma?

ALTERNATIVES - Generate a list of possibilities.

PRO'S & CON'S - What reasons support and do not support the possibilities?

PRO'S:

CON'S:

CRITERIA - List the criteria for judging the alternatives.

SPECIAL EQUIPMENT - List all items such as a tape recorder, construction materials, etc., that may be required.

SOURCES OF INFORMATION - List the primary and secondary sources of information.

People:

Books, films, places, etc.:

FINAL PRODUCT - What form will it take? How will the results be communicated?

DECISION - What is the final decision? Why?

RESULTS - How did the plan work? What modifications, if any, took place?

SCHOOL INVENTION APPLICATION

PROJECT XL
A Quest for Excellence

Name: _____ School: _____

Grade: _____ Advisor: _____

Inventive Thinking Project Title: _____

Explain how you got the idea for this invention:

How does the invention work, and how is it helpful?

What does the invention look like? Label all of the parts.

SAMPLE LETTER TO PARENTS

PROJECT XL
A Quest for Excellence

To: The Parent(s) of_____

From: Our School _____

Subject: Creativity and Imagination

You are invited to share a grand-national adventure—a learning experience parents and their children are embarking upon throughout America.

The Inventive Thinking Curriculum Project is a school activity which promotes analytical and creative thinking and problem solving. Parents can enjoy this project at home with their children by encouraging creative ideas, letting them share ideas with the family, and by assisting them with making models of their inventive ideas.

Our students will be asked to survey you, their friends, and other family members to discover a problem that needs solving. Perhaps the cap is always left off of the toothpaste or your child is always losing sneakers, pencils or mittens. Once the children find problems to solve, they will begin thinking of many ideas that might solve those problems. When they do this, they will be combining many of the skills learned in science, social studies, language, writing, art, library, math, and more.

Each student participating in the Inventive Thinking Curriculum Project will receive a certificate of recognition from the Assistant Secretary and Commissioner of Patents and Trademarks in Washington, D.C., and will share the invention with other students at our school.

Thank you for your support in this special and imaginative adventure in learning. You will be receiving more information during the school year.

_____
Teacher

_____
Principal

Certificate of Recognition

for

Innovative Achievement

presented to

_____

Bruce A. Lehman

Bruce A.Lehman
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

PROJECT XL
A Quest for Excellence

_____
School Official

_____
Date

"to promote the progress of science and the useful arts..." Article 1, Section 8, U.S. Consititution

POSITIVE COMMENTS

Presenter's Name:_____

What I like most about your invention is:_____

_____

_____

"Praise is the best diet for us, after all..."
Sydney Smith

POSITIVE COMMENTS

Presenter's Name:_____

What I like most about your presentation is: _____

_____

_____

"The greatest invention of the nineteenth century was the invention of the method of invention."
Alfred North Whitehead

POSITIVE COMMENTS

Inventor:_____

Your presentation/invention impresses me because _____

_____

_____

"The applause of a single human being is of great consequence."
Samuel Johnson

YOUNG INVENTOR'S LOG

PROJECT XL
A Quest for Excellence

A log is a diary and a record of your inventive thinking. It should include everything that is related to your project. Every time you write in the log, you should initial and date your entry and also have it signed by a witness. A witness can be anyone who knows what you are working on that day—mom, dad, friend, brother, sister, etc. The list below includes some of the items that might be recorded in your log. You will think of others. Remember, every time you work on your project or just "think" about your idea, you should record it in your inventor's log or notebook.

Ideas for Inventions:

Problems:

Possible Solutions:

Plans:

1. What am I going to invent?
2. What steps will I need to take?
3. What materials will I need?
   What will the materials cost?
4. What problems might occur?
5. How will I present my project?

Resources:

1. Books
2. Other references
3. People

Drawings of Possible Solutions:

Results of Interviews:

Results of Surveys:

Other

51

A PATENT, TRADEMARK, AND COPYRIGHT PRIMER

PROJECT XL
A Quest for Excellence

On March 6, 1646, Joseph Jenkes received the first mechanical patent in North America. Issued by the General Court of Massachusetts, it protected his mill for manufacturing scythes. That was the prelude to the U.S. Patent System which has helped give birth to major industries that have transformed the way we live.

On April 10, 1790, President George Washington signed the bill which laid the foundations of the modern American patent system. Since that time, the U.S. Patent and Trademark Office has recorded and protected the electric lamp of Thomas Edison, the telephone of Alexander Graham Bell, the flying machine of the Wright Brothers, and the inventions of hundreds of thousands of other inventors.

The patent system has protected inventors by giving them an opportunity to profit from their labors, and it has benefited society by systematically recording new inventions and releasing them to the public after the inventors' limited rights have expired.

The U.S. Patent and Trademark Office is one of the most unusual branches of the U.S. Government. Its examining staff of about 2,000 is trained in all branches of science and examines thoroughly every application to determine whether a patent may be granted—a task, in these days, involving the most exhaustive research. Not only must the examiners search United States and foreign patents to learn if a similar patent has been issued, but they must study scientific books and publications to discover whether the idea has ever been described. Previous publications, invention, or use prevents a patent being issued.

In addition to issuing patents, the Patent and Trademark Office has, since 1870, been in charge of registering trademarks, the business community's most valuable asset. More than 1,400,000 trademarks have been issued.

In its earlier days, the U.S. Patent and Trademark Office had on various occasions the responsibility for administering copyright matters, a task that since 1870 has been administered by the Library of Congress; collecting and publishing agricultural information; and even collecting meteorological data. For some years, it was the custodian not only of the famous old Patent Office models—the delight of every visitor to Washington for many years—but of the Declaration of Independence, and other historical documents and relics.

By publishing and distributing copies of every U.S. patent, the U.S. Patent and Trademark Office has made available to the public the world's greatest scientific and mechanical library.

Patents in Brief

A patent is a grant issued by the U.S. Government giving inventors the right to exclude all others from making, using, or selling their inventions within the United States, its territories, and possessions.

There are three kinds of patents: (1) utility patents, granted to the inventor or discoverer of any new and useful process, machine, manufacture, composition of matter, or any new and useful improvement thereof; (2) plant patents, granted on any distinct and new variety of asexually reproduced plant; and (3) design patents, granted on any new, original, and ornamental design for an article of manufacture.

Utility and plant patents are granted for a term which begins on the date of the grant and ends 20 years from the date the patent application was first filed, subject to the payment of maintenance fees; design patents are granted for a term of 14 years from the date of the grant. Patents may be extended only by special act of Congress, except for some pharmaceutical patents whose terms may be extended to make up for time lost due to Government-required testing.

If you plan to file an application, you or your representative should make a search of patents previously granted to make sure that your idea has not already been patented. You may do this at the Public Search Room of the Patent and Trademark Office, Crystal Plaza Building No. 3, 2021 South Clark Place, Arlington, Virginia. Hours are 8:00 a.m. to 8:00 p.m., Monday through Friday except holidays. More limited searches may be made at Patent and Trademark Depository Libraries located throughout the country.

The patent application process can be complex, and the Patent and Trademark Office cannot assist in the preparation of application papers. We strongly advise prospective applicants to engage the services of a patent attorney or agent. Although the PTO cannot recommend any particular attorney or agent and does not control their fees, we do maintain a roster of approximately 17,000 patent attorneys and agents registered to practice before the U.S. Patent and Trademark Office. This roster is available for inspection at Patent and Trademark Depository Libraries, for sale by the Superintendent of Documents at the Government Printing Office, or on the World Wide Web (http://www.uspto.gov).

The basic fee for filing an application for patent ranges from $160 to $770, depending on the type of patent application being filed and whether or not the applicant is entitled to status as a small entity (independent inventor, small business concern, or non-profit organization). Issue fees range from $220 to $1,290. Maintenance fees are due at 3½, 7½, and 11½ years from the date the patent is granted. An individual inventor can expect to pay a minimum of $4,000 for a utility patent.

Applications are assigned to examiners who are experts in various fields of technology. The invention must be new, useful, and unobvious to those in that particular field of study. This procedure normally takes about 19 months.

Disclosure Document Program

Under its Disclosure Document Program, the PTO accepts and preserves for a two-year period papers disclosing an invention pending the filing of an application for patent. This disclosure is accepted as evidence of the dates of conception of the invention, but provides no patent protection nor should it be considered a "grace period" during which the inventor can wait to file a patent application without possible loss of benefits. A fee of $10 is charged for this service.

Provisional Patent Application

A provisional application establishes a filing date but does not begin the examination process. It provides the inventor with a one-year period to further develop the invention, determine marketability, acquire funding or capital, or seek licensing agreements. To obtain a patent, the inventor must file a nonprovisional application within 12 months of the filing date of the provisional application. The fee is $150 or $75 for a small entity.

Trademarks in Brief

A trademark (or brand name or logo) is a word, name, symbol, design, combination of word and design or slogan used by a manufacturer or merchant to identify its goods or services and distinguish them from those manufactured or sold by others. When it is used for services, it can be called a service mark.

Trademark rights come from using the mark, and marks are protected under common law from the time they are first used. While there is no requirement to do so, owners of marks who have used them or have a bona fide intention to use them in Federally regulated commerce may register them with the U.S. Patent and Trademark Office. This provides the owners with certain procedural and legal advantages. For intent-to-use applications, actual use of the mark

in commerce is a prerequisite to the ultimate issuance of a registration.

Many trademark owners use a ™ (trademark) or SM (service mark) symbol with their mark to indicate that they are claiming rights in it. The ® symbol may only be used if the U.S. Patent and Trademark Office issued a Federal registration. To register a mark, the owner must file an application consisting of a written statement in which the owner indicates among other things the goods or services in connection with which the mark is used and the date of first use of the mark in commerce; a drawing of the mark; five specimens showing the mark as it is actually used (labels, tags, packaging, etc.); and the required filing fee of $245 per class.

Each application is reviewed by an examining attorney to determine if the mark is eligible for registration and is compared with other marks to determine if it is likely to cause confusion with those already registered. If a proposed mark passes the examination, it is then published in the *Official Gazette* of the Patent and Trademark Office. Those who believe they will be damaged by registration of the mark then have an opportunity to oppose registration. If no opposition is filed, a registration certificate is issued or a notice of allowance is issued to the applicant in an intent-to-use application. Within six months after the issuance of the notice of allowance, the applicant must file specimens evidencing use of the mark in commerce, a fee of $100, and a verified statement that the mark is in use in commerce before a registration certificate is issued. The registration may be renewed every 10 years as long as the registrant is still using the mark.

Note: Fees mentioned above represent only the minimum required for a patent or trademark application. Additional fees may be due during the prosecution of an application. Fees are current as of October 1996. Fee increases, when necessary, usually take effect on October 1 of any given year. For a complete list of fees or further information, write to the U.S. Patent and Trademark Office, Center for Patent and Trademark Information, Washington, DC 20231, or call 800-786-9199 or 703-308-HELP(4357).

Copyrights in Brief

The seeds of copyright protection were sown in Gutenberg's development of the printing press that ultimately led to the first printed copyright statute, the English Statute of Anne. Both the printing press and the concept of copyright protection followed the colonists to the new world. The state legislature of 12 of the first states passed copyright laws before Congress enacted the first Federal law. On may 31, 1790, Congress used the power given it in Article 1 Section 8 of the U.S. Constitution to "promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries" and enacted the first Federal Copyright Act.

Noah Webster, the compiler of both the first American speller and an early dictionary, played a major role in getting both the state laws and the first Federal statute enacted. He traveled to each legislature and described the authors' plight and their need for copyright protection. Authors have continued to guard the rights granted by the Constitution and to ensure that new technologies permitting copying do not erode these rights.

What is copyright and when does copyright protection arise? Federal copyright legislation gives an author certain exclusive rights for a limited time: the right to reproduce the copyrighted work, to prepare derivative works, to distribute copies or phonorecords, to perform the work publicly, and to display the work publicly. Congress attempts to create a balance between the rights given to authors and the legitimate needs for society. There are some limitations or exemptions that permit society to make specific uses of copyrighted works.

Copyright subsists in an original work of author-

ship from the time the work is first created or fixed in any tangible medium of expression, now known or later developed, from which that work can be perceived, reproduced, or otherwise communicated. A work is put in a tangible form, for example, when a literary work is typed or written or a piece of music captured on tape.

Copyright covers the expression of ideas and not the idea itself. Thus, copyright does not cover "any idea, procedure, process, system, method of operation, concept, principle, or discovery..." It does not, for example, protect blank checks, standardized material, titles, or government works.

What does copyright protection mean for an author? Copyright means that no one may appropriate the copyright owner's exclusive right to reproduce, distribute, perform, or display a work without permission from the author unless the right has been transferred to the user or the person who authorizes or licenses this particular use, or an exemption covers the use in question.

What works does copyright protect? The first law protected maps, charts, and books for a basic term of 14 years; since 1790 the copyright law has evolved to include musical works, dramatic works, photographs, paintings, and other works of art, motion pictures, and sound recordings.

Literary works: Copyright protects literary works of all types from novels such as *Gone With the Wind* or *The Catcher in the Rye,* to text books and other fact-based accounts, including newspapers. Although copyright covers the expression in nonfiction works, it does not cover the facts themselves. They are uncopyrightable and can be freely used by anyone. Copyright in the literary works also covers printed speeches such as Martin Luther King, Jr.'s famous "I have a dream" speech. Today, even computer programs are protected as literary works.

Musical works: Copyright covers all kinds of music from the songs performed on the radio to the music in television commercials and MTV.

Dramatic works: Copyright covers every kind of permanently fixed dramatic work from senior plays such as Our Town performed by high schools, to such current Broadway blockbusters as Phantom of the Opera, M. Butterfly, or the latest Neil Simon offering. It covers those plays written especially for the theater like Arthur Miller's classic Death of a Salesman and also those based on other popular works like the adaptation of Kafka's short story Metamorphosis.

Pantomimes and choreographic works: Copyright protects dance sequences in stage shows like Chorus Line or Cats if they are in tangible form.

Pictorial, graphic, and sculptural works: Works created by sculptors, photographers, painters, and other graphic artists are protected by copyright. The works covered include not only paintings, photographs, and sculptures, but also advertisements, the artwork on game boards, and the artwork on fabrics or textiles.

Motion pictures and other audiovisual works: Classics like The Wizard of Oz or the latest Steven Spielberg or Woody Allen film are protectible, as are television programs and ideograms, including the once very popular Pac Man and the currently popular Nintendo games.

Sound recordings: The copyright law was amended in 1971 to include sound recordings. Copyright now protects the latest recording of your favorite artists in any format—disk (be it 45, 33, or compact disk), tape, or cassette. The copyright authorship protected in a sound recording is twofold: it covers the contribution of both the performer and the record producer responsible for the recording.

How long is a work protected? As noted earlier, the 1790 act provided a 14 year term. Mark Twain was one of the authors who persuaded Congress that the term should be longer. In 1909 the term was extended to protect authors for a 28 year term plus a possibility of 28 more years if the author renewed his or her claim in a timely

fashion. Then in 1976 the term was extended again to its current length: the life of the author plus 50 years. Special rules apply to works created by employees as part of their jobs such as motion pictures and anonymous or pseudonymous works.

When the term of the protection expires on a particular work, it may be used freely by anyone.

Where is the work protected? A work copyrighted in the United States is protected here as well as in all of the other countries with whom we have copyright relations by our membership in the two multilateral copyright treaties—the Universal Copyright Convention and the Berne Convention for the Protection of Literary and Artistic Works, by presidential proclamation, or bilateral relations. The United States has copyright relations with over 100 countries.

Note: The filing fee for each application is $20. The Copyright Office has the authority to adjust fees at five-year intervals. Additional information concerning copyrights may be obtained from the Library of Congress, Information Section, LM-455 Copyright Office, Washington, DC 20559. Telephone 202-707-2100.

It is illegal for anyone to violate any of the rights provided to the owners of the intellectual property by patents, trademarks, and copyrights.

APPENDIX

PROJECT XL

A Quest for Excellence

APPENDIX

1. Article 1, Section 8, Clause 8 of the U.S. Constitution.
2. Copy of the first U.S. patent issued and signed by George Washington in 1790.
3. Copies of selected patents granted to inventors who changed the world:
   * Abraham Lincoln . . . . . manner of bouying vessels
   * Alexander Graham Bell. . . . . telegraphy
   * Auguste Bartholdi. . . . . statue [of liberty]
   * Thomas Alva Edison. . . . . electric lamp
   * Lewis Howard Latimer . . . . . electric lamp
   * Granville T. Woods . . . . . electric railway
   * Orville and Wilbur Wright . . . . . flying machine
   * Harry Houdini . . . . . diver's suit
   * Garrett A. Morgan . . . . . traffic signal
   * George Washington Carver . . . . . paint and stain and process...
   * H. F. Bosenberg . . . . . climbing or trailing rose
   * An Wang . . . . . pulse transfer controlling devices
   * Phillip J. Stevens. . . . . variable area nozzle
   * Ysidro M. Martinez . . . . . knee implant prosthesis
   * Philip Leder . . . . . transgenic non-human mammals
4. More than a toy. . . . . selected toy patents.
5. Rumor has it... that a patent office official resigned because "everything that can be invented has been invented."

The Constitution of the United States of America

Article 1, Section 8, Clause 8

The Congress shall have the power...

to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.

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The First Patent Grant in the United States

The patent grant you see reproduced on the next page was the first one issued by the United States, to Samuel Hopkins of Pittsford, Vermont in 1790. Two other patents were granted that year: one for a special process of making candles and one for improved flour milling machinery. The Hopkins patent was for an "Improvement, not known before such Discovery, in the making of Pot ash and Pearl ash by a new apparatus and Process", and was granted for a term of fourteen years.

The name potash refers to several potassium salts, mild alkalis, which were derived from the ashes of timber or other plants. It was also known in a caustic form when mixed with lime. In reacting with fats or oils, potash produced a soft soap. It was an essential ingredient in the manufacture of glass, alum (salts of aluminum—used chiefly in medicine), and saltpetre (an important ingredient in gun powder). Potash also played an important role in bleaching, mining, metallurgy, and other industrial interests. Its many applications served as an indication of the emerging chemical industry in the nineteenth century.

In the summer of 1956, the Vermont Historic Sites Commission erected a marker at the former residence of Samuel Hopkins. The original patent granted to him still exists in the collections of the Chicago Historical Society.

The United States

To all to whom these Presents shall come. Greeting.

Whereas Samuel Hopkins of the City of Philadelphia and State of Pensylvania hath discovered an Improvement, not known or used before such Discovery, in the making of Pot ash and Pearl ash by a new Apparatus and Process, that is to say, in the making of Pearl ash 1st by burning the raw Ashes in a Furnace, 2d by dissolving and boiling them when so burnt in Water, 3rd by drawing off and settling the ley, and 4th by boiling the ley into Salts which then are the true Pearl ash, and also in the making of Pot ash by fluxing the Pearl ash so made as aforesaid; which Operation of burning the raw Ashes in a Furnace, preparatory to their Dissolution and boiling in Water, is new, leaves little Residuum; and produces a much greater Quantity of Salt: These are therefore in pursuance of the Act, entituled "An Act to promote the Progress of useful Arts" to grant to the said Samuel Hopkins, his Heirs, Administrators and Assigns, for the Term of fourteen Years, the sole and exclusive Right and Liberty of using and vending to others the said Discovery, of burning the raw Ashes previous to their being dissolved and boiled in Water, according to the true Intent and Meaning of the Act aforesaid. In Testimony whereof I have caused these Letters to be made patent, and the Seal of the United States to be hereunto affixed. Given under my Hand at the City of New York this thirty first Day of July in the Year of our Lord one thousand seven hundred & Ninety.

G. Washington

City of New York July 31st. 1790. -

I do hereby certify that the foregoing Letters patent were delivered to me in pursuance of the Act, entitled "An Act to promote the Progress of useful Arts"; that I have examined the same, and find them conformable to the said Act.

Edm. Randolph Attorney General for the United States.

61

62

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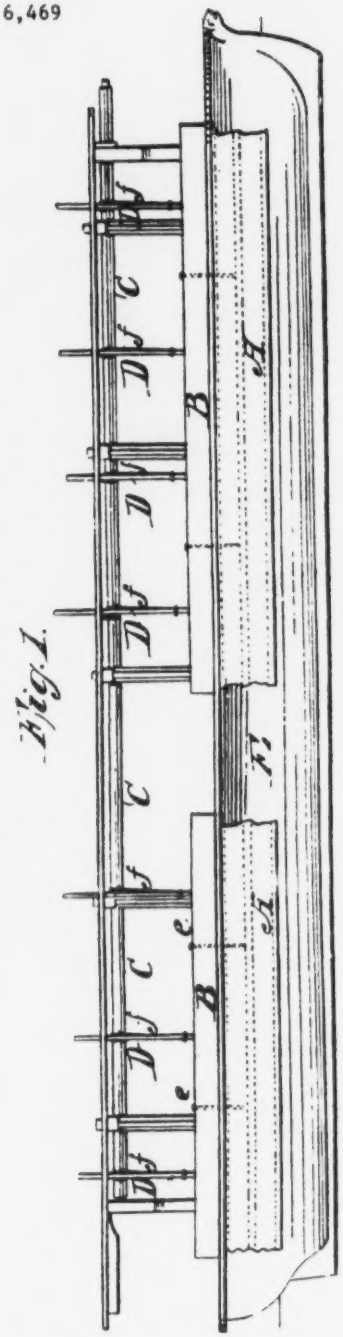
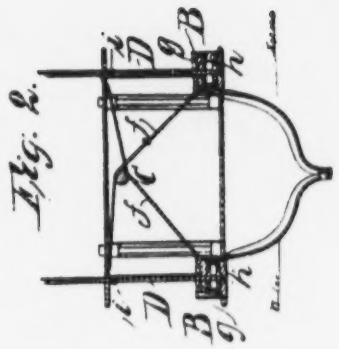
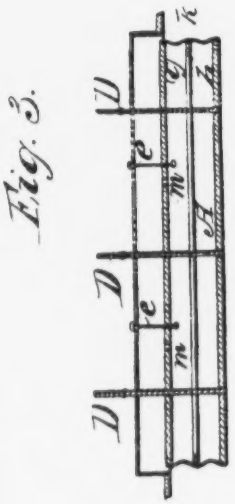
ABRAHAM LINCOLN

MANNER OF BOUYING VESSELS

No. 6,469 Patented May 22, 1849







Abraham Lincoln is the only U.S. president to receive a patent. Lincoln was a congressman from Illinois in 1849 when he was issued Patent No. 6,469 for a "manner of buoying vessels."

As a young man, Lincoln took a boatload of merchandise down the Mississippi River from New Salem to New Orleans. The boat slid onto a dam and was dislodged only after heroic efforts. A few years later, while crossing the Great Lakes, Lincoln's ship ran afoul of a sandbar. These two similar experiences led him to invent a solution to the problem.

The invention consists of a set of bellows attached to the hull of a ship just below the water line. When a vessel is in danger of getting stuck in shallow water, the bellows are filled with air, and the vessel, thus buoyed, floats clear of the obstacle.

Although Lincoln probably never profited from his invention, he was a strong supporter of the patent system, saying that the patent system "added the fuel of interest to the fire of genius, in the discovery and production of new and useful things."

A. G. BELL.

TELEGRAPHY.

No. 174,465. Patented March 7, 1876.

Fig. 1

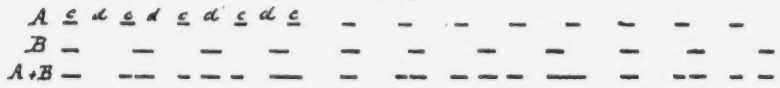


Fig. 2.

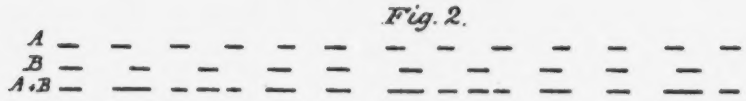


Fig. 3.

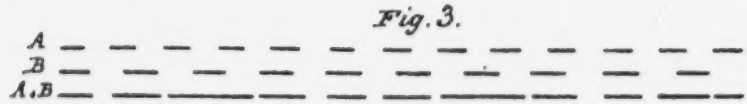


Fig. 4.

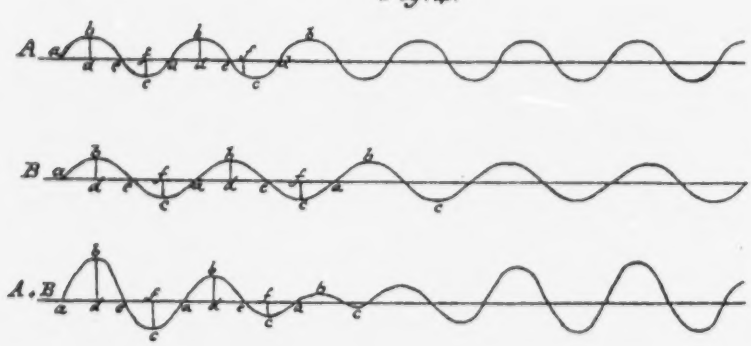
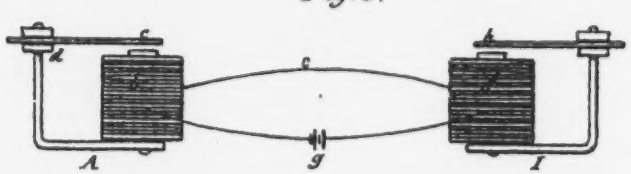


Fig. 5.



Witnesses

Ewell A. Brock.

W. T. Hutchinson

Inventor:

A. Graham Bell

by attys. Pollock & Bailey

"Well informed people know it is impossible to transmit the voice over wires, and that, were it possible to do so, the thing would be of no practical value." Boston Post editorial, 1865

DESIGN.

A. BARTHOLDI.

Statue.

No. 11,023. Patented Feb. 18, 1879.

LIBERTY ENLIGHTENING THE WORLD.

Witnesses:
Ed. F. Dick
J. B. Carpenter.

Inventor:
Auguste Bartholdi
by R. Pollok
atty.

Perhaps the most famous of all design patents is the Statue of Liberty.

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T. A. EDISON.
Electric-Lamp.

No. 223,898. Patented Jan. 27, 1880.

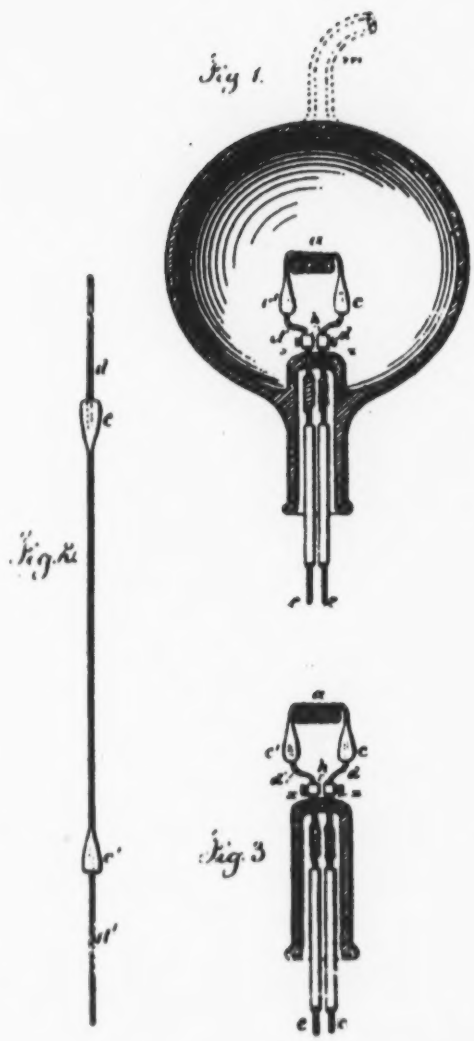
Contrary to popular belief, Thomas Alva Edison didn't "invent" the light bulb, but rather he improved upon a 50-year-old idea. In 1879, using lower current, a small carbonized filament, and an improved vacuum inside the globe, he was able to produce a reliable, long-lasting source of light. Perhaps more importantly, Edison's invention led to an industry to distribute electric power creating jobs for many Americans.

Edison was granted his first patent on June 1, 1869, and averaged one patent application every 11 days between 1869 and 1910. America's most prolific inventor received 1,093 patents—more than any other person before or since. While he reveled in and profited from his successes, he lived with failure every day.

"Results? Why man, I've gotten a lot of results. I know several thousand things that won't work."

Thomas Alva Edison, 1900

In 1973, Edison was the first inventor inducted into the National Inventors Hall of Fame.



Witnesses
Chas. H. Smith
Geo. P. Makepeace

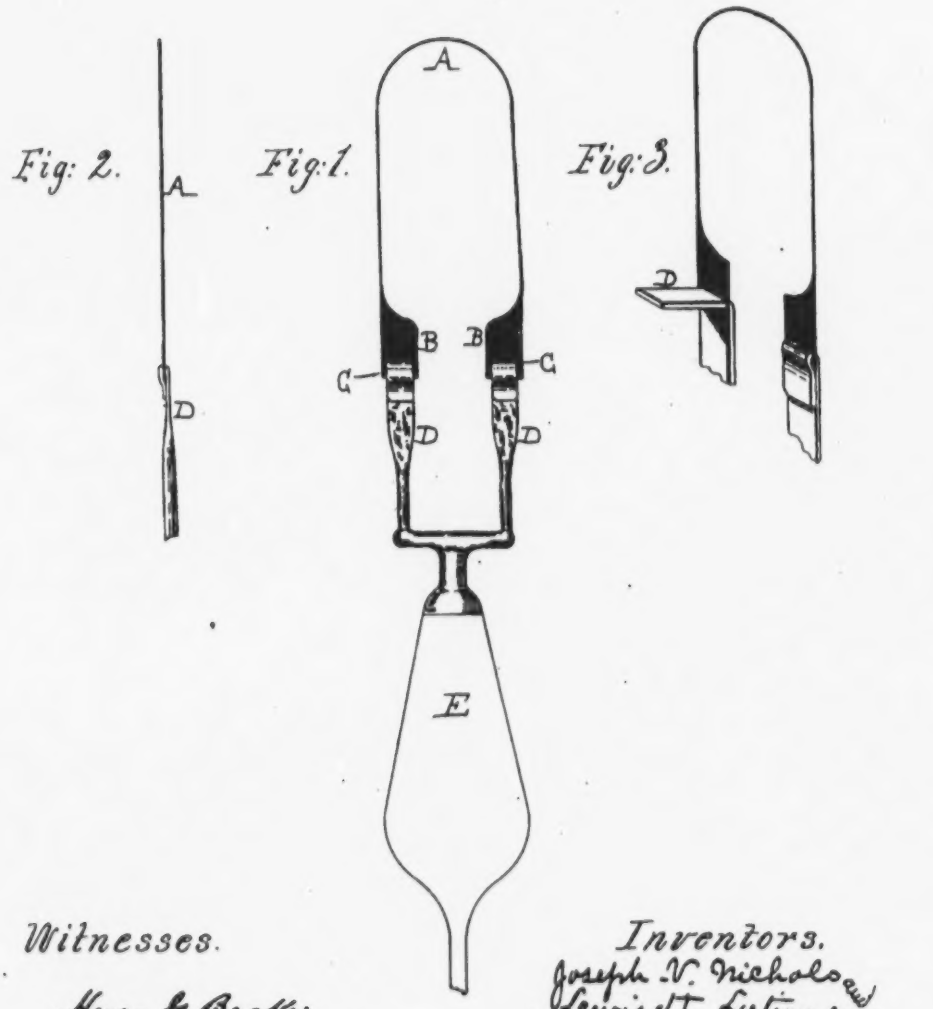
Inventor
Thomas A. Edison
for Lemuel W. Serrell
atty.

(No Model.)

J. V. NICHOLS & L. H. LATIMER.

ELECTRIC LAMP.

No. 247,097. Patented Sept. 13, 1881.



Witnesses.

Henry C. Bowles

Edw. Gulager

Inventors.

Joseph V. Nichols and

Lewis H. Latimer

per Parker W. Page atty

Lewis Howard Latimer was employed by a Patent Solicitor where he began the study of drafting. His talent for drafting and his creative genius led him to invent a method of making carbon filaments for the electric incandescent lamp. Latimer was the original draftsman for Thomas Edison and the star witness in suits which infringed upon Edison's patents.

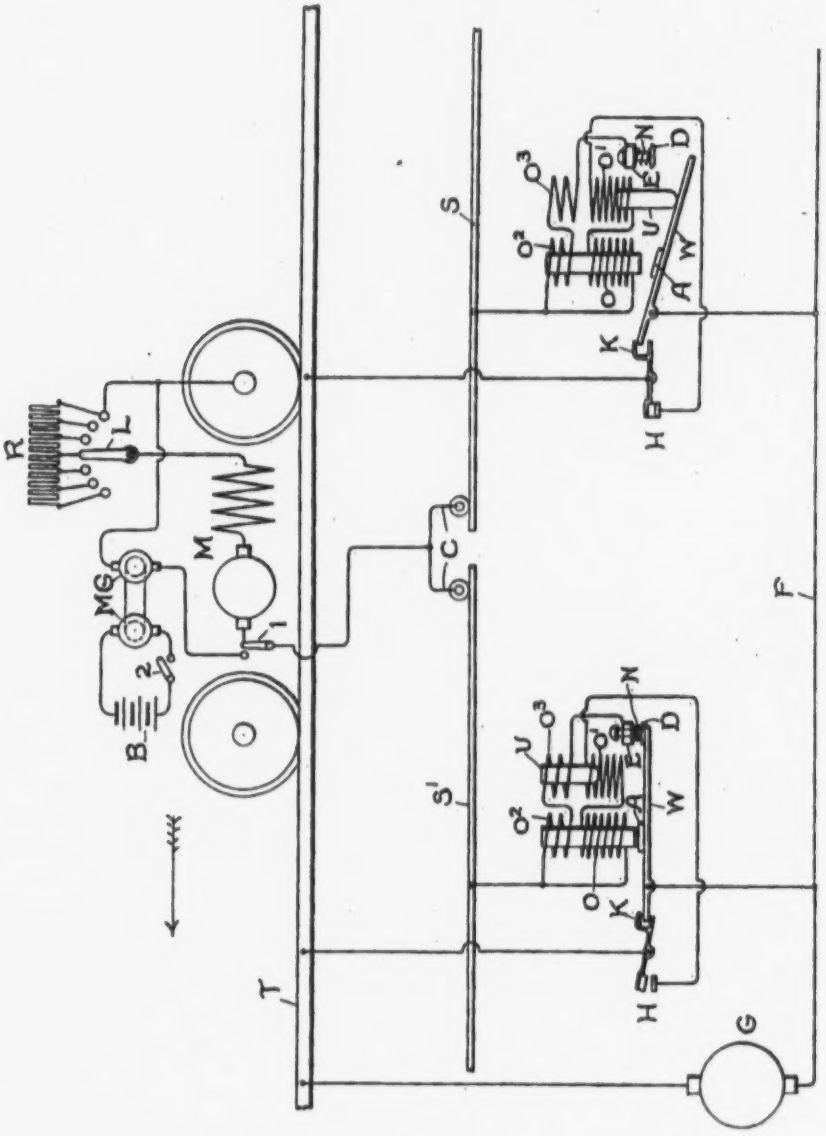
No. 687,098. Patented Nov. 19, 1901.

G. T. WOODS.

ELECTRIC RAILWAY.

(Application filed June 29, 1900.)

(No Model.)



Witnesses.
Edward Williams, Jr.
Alex. F. Macdonald.

Inventor:
Granville T. Woods,
by Albert G. Davis
Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 821,393. PATENTED MAY 22, 1906.

O. & W. WRIGHT.

FLYING MACHINE.

APPLICATION FILED MAR. 23, 1903.

3 SHEETS—SHEET 1.

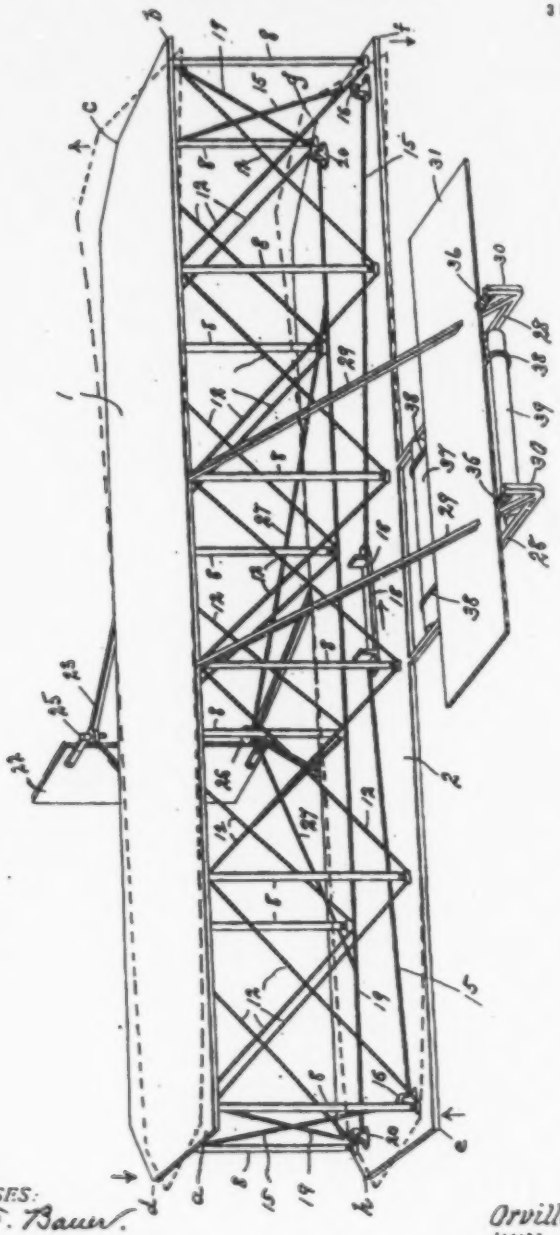


FIG. 1.

WITNESSES:
William F. Bauer.
Ivorine Miller.

INVENTORS.
Orville Wright.
Wilbur Wright.
BY
H. A. Toulmin,
ATTORNEY.

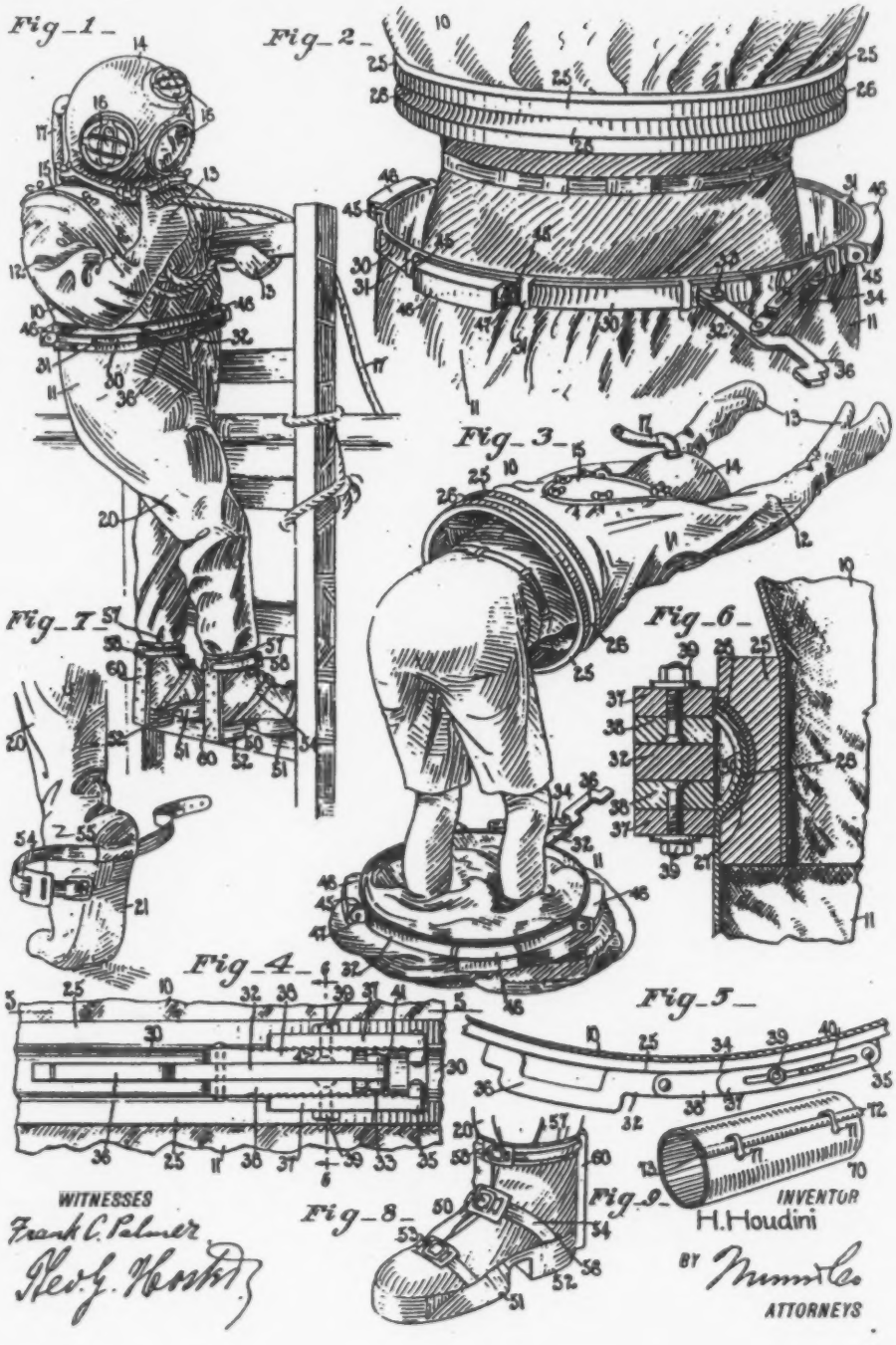
"Heavier than air flying machines are impossible." Lord Kelving, President, Royal Society, c. 1895

H. HOUDINI.

DIVER'S SUIT.

APPLICATION FILED JUNE 30, 1917.

1,370,316. Patented Mar. 1, 1921.



Famous magician Harry Houdini (born Ehrich Weiss in Budapest, Hungary in 1874) was also an inventor. Houdini began his career as a trapeze artist and was later renowned as a magician and an escape artist. He astonished audiences by escaping from handcuffs, straitjackets, and prison cells. Houdini's invention for a "diver's suit" permits divers, in case of danger, to quickly divest themselves of the suit while submerged and to safely escape and reach the surface of the water.

In his later years, Houdini put his extensive knowledge of the occult and magic to public benefit by exposing the tricks of fraudulent spiritualistic mediums. Houdini left his entire library of magic to the U.S. Library of Congress.

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Nov. 20, 1923. 1,475,024

G. A. MORGAN

TRAFFIC SIGNAL

Filed Feb. 27. 1922 2 Sheets-Sheet 1

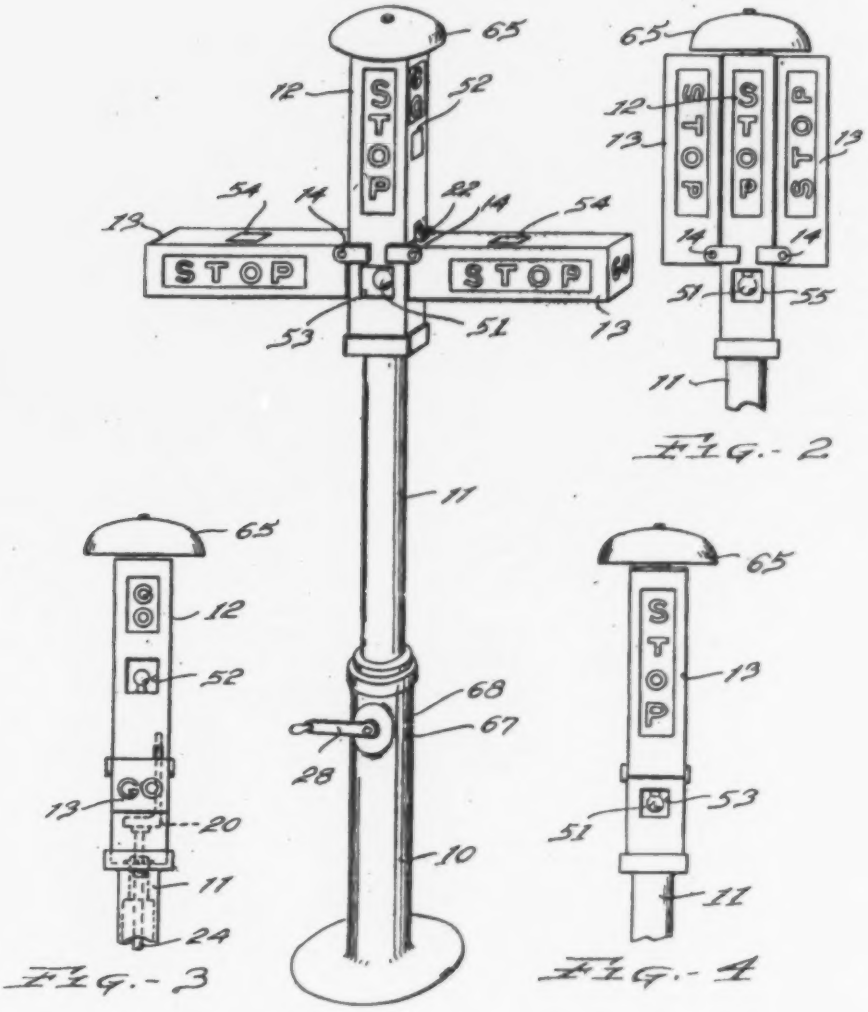

FIG. - 1

FIG. - 2

FIG. - 3

FIG. - 4

INVENTOR
Garrett A. Morgan,
By Baker Maeklin,
ATTORNEYS

Patented June 9, 1925. 1,541,478

UNITED STATES PATENT OFFICE.

GEORGE W. CARVER, OF TUSKEGEE, ALABAMA.

PAINT AND STAIN AND PROCESS OF PRODUCING THE SAME.

No Drawing. Application filed June 13, 1923. Serial No. 645,199.

To all whom it may concern:

Be it known that I, GEORGE W. CARVER, a citizen of the United States, residing at Tuskegee, in the county of Macon and State of Alabama, have invented certain new and useful Improvements in Paints and Stains and Processes of Producing the Same, of which the following is a specification.

The invention relates to paints and stains, and has as an object the provision of a process for producing paints and stains from clays. Clays are found in many sections of the country of a variety of colors, and by a proper choice of color there may be produced by the process of the invention a large variety of colors of pigments, fillers and stains for treating wood or other materials.

To carry out the process of the invention the desired clay having a high percentage of iron is treated by any of the well known processes for refining the same and reducing it to a finely divided condition. A desirable composition for a clay to be treated by the process of the present invention is 5.6% peroxide of iron and 16.7% aluminum.

While a clay testing as above described and substantially free from lime or any similar alkali is suitable for the carrying out of the process, yet a higher iron content will vary the effect only by improving the result.

To reduce the clay to a gelatinous condition the same is treated with acid. For this purpose taking as a basis a quantity of 25 pounds of clay free from sand or other objectionable substances, 25 pounds of commercial sulphuric acid and 25 pounds commercial hydrochloric acid may be added to the clay, with three pounds of clean scrap iron of any kind, iron turnings being a desirable form for the iron. The clay and iron are put into an acid-proof vessel which is capable of withstanding heat, as for instance a porcelain vessel. The acids are added with enough water to make a thin paste. The substance is then boiled slowly, with frequent stirring, until the iron is dissolved, and the whole mass assumes a uniform color.

Water free from alkali is then added sufficient to substantially double the volume, when the solution is well stirred and allowed to settle for about five minutes, for the purpose of settlement of coarser portions. The material remaining in suspension with the liquid is then decanted into shallow acid-proof vessels and the remaining coarse and insoluble material is thrown away.

The material thus secured is utilized as a base for subsequent steps, the nature of which, as well as the nature of the clay first taken for treatment may be chosen to vary the color of the resultant products.

As a variation of the above process the nitric acid may be added with the sulphuric and hydrochloric, but it is found that slightly inferior results are thus obtained. Moreover copperas may be substituted for the scrap iron with, however, probably not such fine results.

For use as a wood filler or stain, clay of a desired color may be treated with the acid as above described, and the thus secured gelatinous clay is found to strike into the wood fiber and to produce an exceedingly smooth surface, giving a color thereto dependent upon the color of clay chosen for treatment, thereby acting as a filler and stain with the single application. It is found that a filler made as thus described becomes very hard when dry and enables the wood to take a high polish. Moreover specimens of wood which have been thus treated are found, after twenty years, to be brighter and more beautiful than when first treated. For this use the iron scrap may be omitted if desired.

The material thus described as a compound filler and stain, may be dried and mixed with linseed oil or its equivalent as a pigment to provide a paint. If desired to be darkened to a slight extent some good grade of carbon or lamp black may be added.

When the above acid treatment is carried out utilizing a micaceous clay of the variety of shades which occur in the Southern States a sheen results that has not to my knowledge been secured by heretofore used artificial mixtures.

I claim:

1. The process of producing pigment or the like which comprises boiling clay and metallic iron with acid and separating the coarser particles therefrom.

2. The process of producing pigments or the like which comprises boiling a mixture of clay and scrap iron with a mixture of sulphuric and hydrochloric acid, and separating the coarser particles therefrom, the color of clay utilized being chosen in accordance with the color desired in the finished product.

GEORGE W. CARVER.

"When you can do the common things in life in an uncommon way, you will command the attention of the world." George Washington Carver

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Aug. 18, 1931. H. F. BOSENBERG Plant Pat. 1

CLIMBING OR TRAILING ROSE

Filed Aug. 6, 1930

Fig. 1

Fig 2

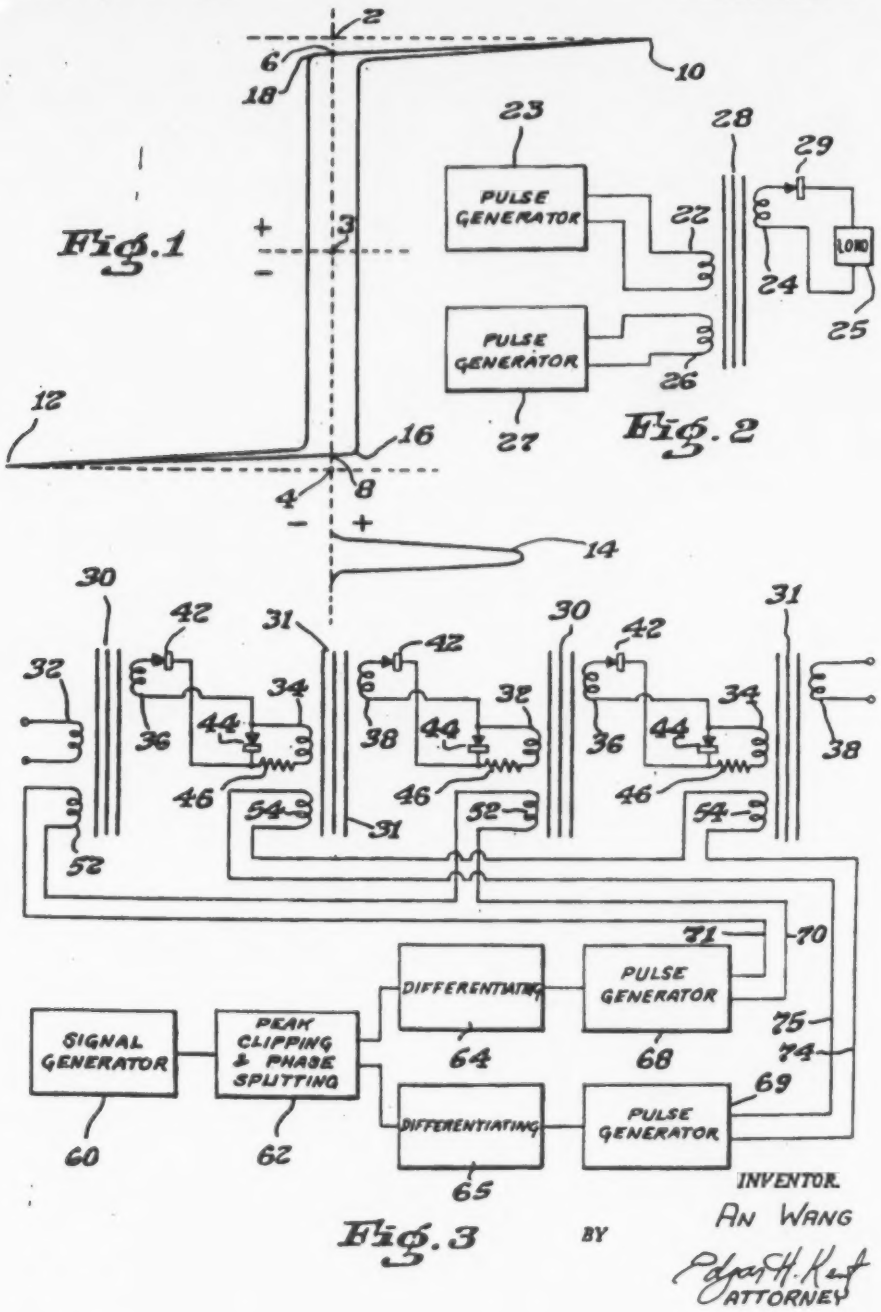
Since 1930, plants have been patentable. The first plant patent was granted to Henry F. Bosenberg for a climbing or trailing rose.

INVENTOR.
Henry F. Bosenberg.
Per Agent.
Orville M. Kile

May 17, 1955 AN WANG 2,708,722

PULSE TRANSFER CONTROLLING DEVICES

Filed Oct. 21, 1949 3 Sheets-Sheet 1



An Wang was born in Shanghai, China. He immigrated to the United States in 1945 and received his Ph.D. in applied physics from Harvard University in 1948. He founded Wang Laboratories in 1951 to develop specialty electronic devices. Dr. Wang is responsible for the original development of the basic components and systems of digital computing machines. He held more than 35 patents, revolutionizing the information processing industry. Dr. Wang was inducted into the National Inventors Hall of Fame in 1988.

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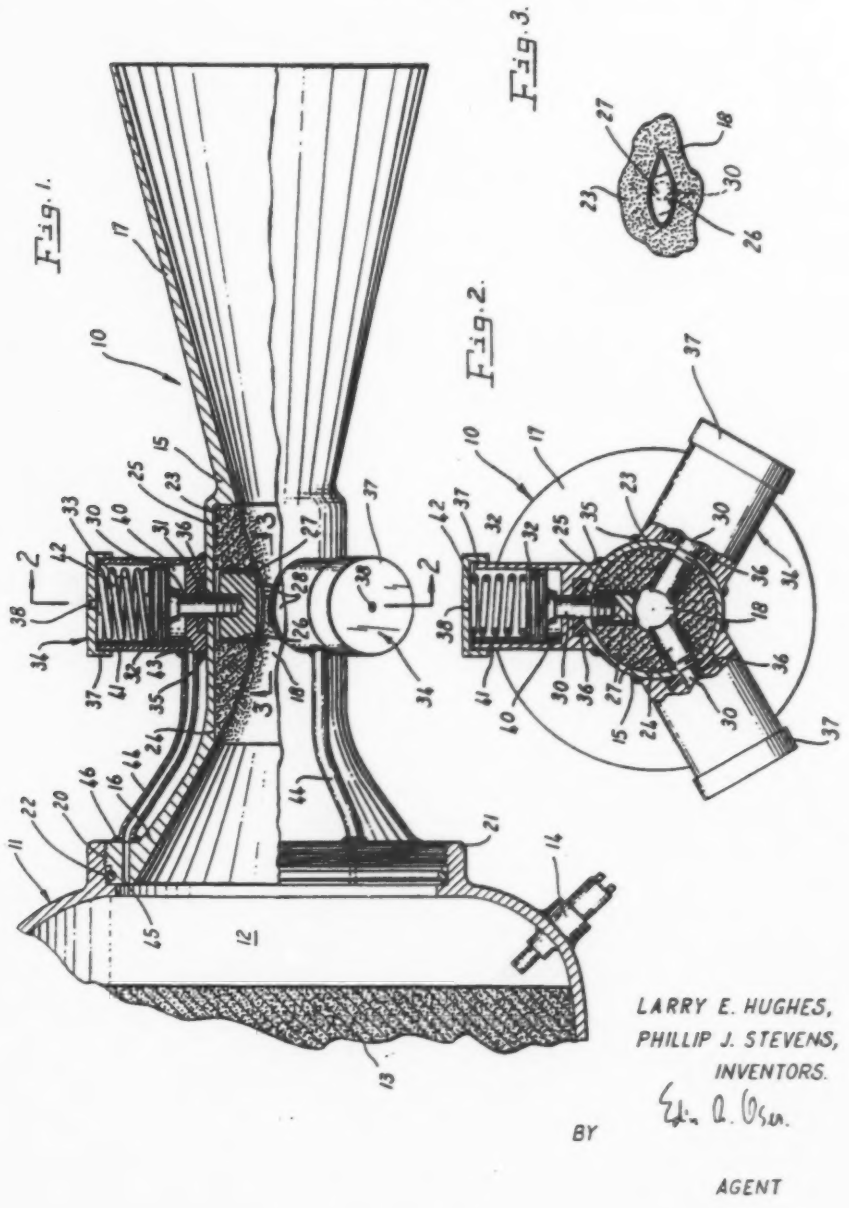
Jan. 24, 1961 L. E. HUGHES ET AL 2,968,919

VARIABLE AREA NOZZLE

Filed March 25, 1957



Phillip J. Stevens holds several patents for innovative concepts in weaponry. He directed the Minuteman III Weapon System at TRW, Inc., and founded Ultrasystems, Inc., a high-technology business enterprise. A former director of the United Indian Development Association, he received multiple awards for leadership, innovation, and support of the Native American people.

Stevens with co-inventor, Larry E. Hughes, invented a new nozzle to control delivery of propellants from rocket motors. The new variable area throat nozzle was simple in construction, light in weight, efficient in operation, and relatively inexpensive to manufacture.

United States Patent [19]

Martinez

[11] **3,909,854**

[45] **Oct. 7, 1975**

[54] **KNEE IMPLANT PROSTHESIS**

[76] Inventor: **Ysidore M. Martinez**, 5608 Lakewood Dr., La Mesa, Calif. 92041

[22] Filed: **Nov. 18, 1974**

[21] Appl. No.: **524,708**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 356,816, May 3, 1973, Pat. No. 3,848,276.

[52] **U.S. Cl.** ..... **3/1.911**; 128/92 C

[51] **Int. Cl.²** **A61F 1/24**

[58] **Field of Search** ..... 3/1, 1.9–1.911, 3/22; 128/92 C

[56] **References Cited**

UNITED STATES PATENTS

2,696,817	12/1954	Prevo	128/92 C
3,696,446	10/1972	Bousquet et al.	3/1.911
3,765,033	10/1973	Goldberg et al.	3/1.911
3,824,630	7/1974	Johnston	128/92 C X
3,837,009	9/1974	Walker	3/1.911

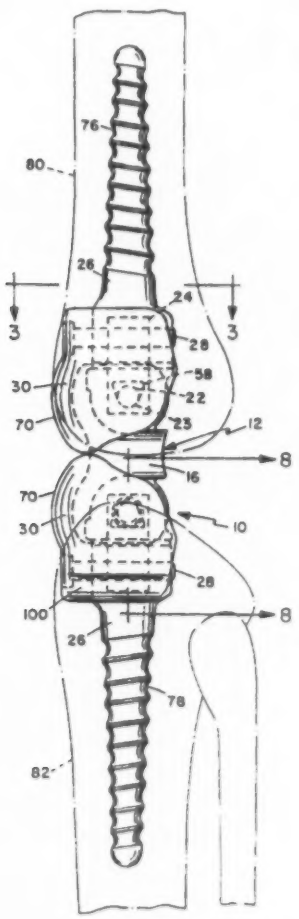
Primary Examiner—Ronald L. Frinks

Attorney, Agent, or Firm—Brown & Martin

[57] **ABSTRACT**

A knee prosthesis for replacing the functions of the natural knee including the ability of the natural knee to rotate, abduct-adduct and flex. The device incorporates spaced pivot bearings mounted in a pivot body. The pivoting structure is connected to the natural bone structure by a connector screw received in the bone, and a connector shield received in a cavity surgically prepared in the bone. Resilient plastic material provides a resistance restoring force for the abduction-adduction and rotation modes.

14 Claims, 8 Drawing Figures



Ysidro M. Martinez' invention of a below-the-knee prosthesis avoids some of the problems associated with conventional artificial limbs. Martinez, an amputee himself, took a theoretical approach in his design. He does not attempt to replicate the natural limb with articulated joints in the ankle or foot which is seen by Martinez as causing poor gait. His prosthesis has a high center of mass and is light in weight to facilitate acceleration and deceleration and reduce friction. The foot is considerably shorter to control acceleration forces, reducing the friction and pressure.

United States Patent [19]

Leder et al.

[11] **Patent Number: 4,736,866**

[45] **Date of Patent: Apr. 12, 1988**

[54] **TRANSGENIC NON-HUMAN MAMMALS**

[75] Inventors: **Philip Leder**, Chestnut Hill, Mass.; **Timothy A. Stewart**, San Francisco, Calif.

[73] Assignee: **President and Fellows of Harvard College**, Cambridge, Mass.

[21] Appl. No.: **623,774**

[22] Filed: **Jun. 22, 1984**

[51] Int. Cl.[4] C12N 1/00; C12Q 1/68; C12N 15/00; C12N 5/00

[52] U.S. Cl. 800/1; 435/6; 435/172.3; 435/240.1; 435/240.2; 435/320; 435/317.1; 935/32; 935/59; 935/70; 935/76; 935/111

[58] Field of Search 435/6, 172.3, 240, 317, 435/320, 240.1, 240.2; 935/70, 76, 59, 111, 32; 800/1

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Palmiter et al. (1982) Nature 300, 611–615.
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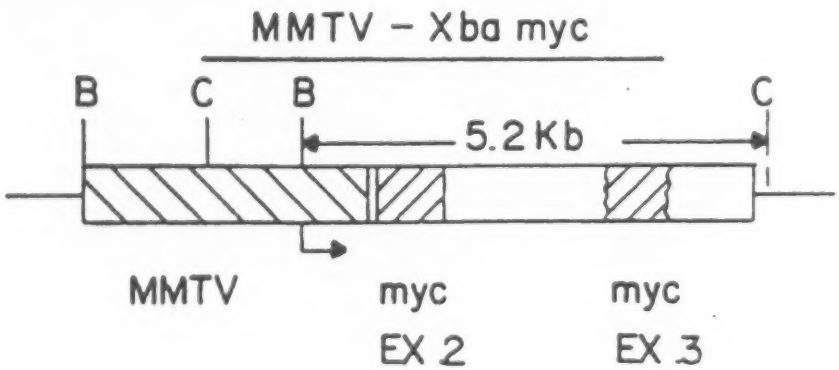
Primary Examiner—Alvin E. Tanenholtz
Attorney, Agent, or Firm—Paul T. Clark

[57] **ABSTRACT**

A transgenic non-human eukaryotic animal whose germ cells and somatic cells contain an activated oncogene sequence introduced into the animal, or an ancestor of the animal, at an embryonic stage.

12 Claims, 2 Drawing Sheets



The mouse that went to Harvard... was the first animal to be patented in the United States. In the 1980s, Philip Leder devised a method of introducing specific oncogenes (genes with the potential to cause other cells to become cancerous) into mice. The transgenic non-human eukaryotic animal is bred to contract breast cancer for medial research to facilitate carcinogen testing and development of cancer therapies. As you can imagine, the patenting of living organisms (nonhuman) has generated controversy and a lot of public debate on the ethical, religious, economic, and regulatory issues arising from their use.

More than a toy...

Everyone has a favorite toy—a cuddly bear, a rugged truck, a special game. But how many of us connect that toy with a multi-billion dollar industry that thrives on innovation?

America's toy manufacturers and retailers depend heavily on intellectual property protection. Toy inventors use both utility and design patents, along with trademarks and copyrights to prevent others from copying or profiting from their inventions or their trade names. In fact, many toys—especially video games—take advantage of all three types of intellectual property protection.

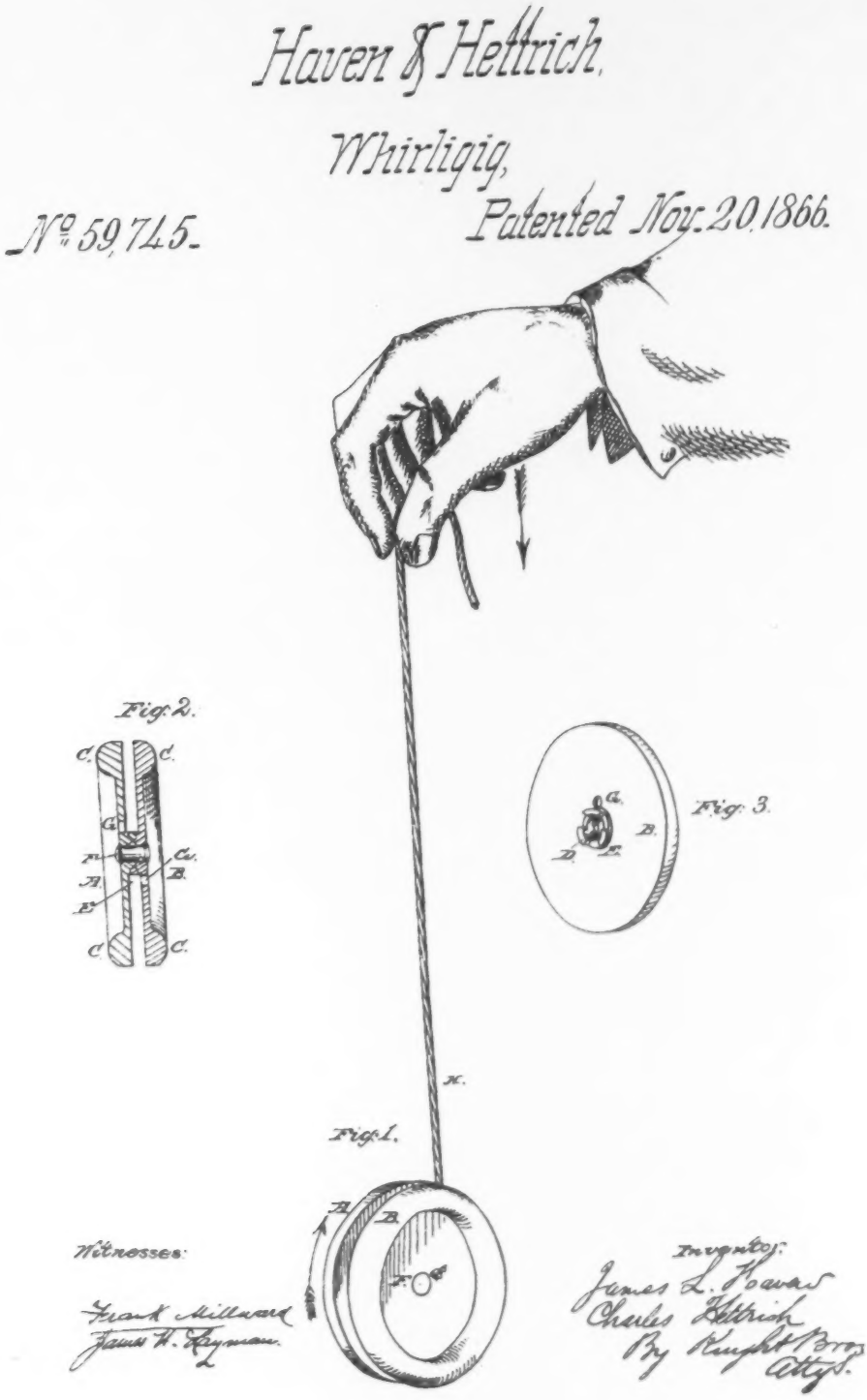
Americans did not enter the toy "business" until the 1830's, when steamboats and steam trains improved the transportation and distribution of manufactured goods. Early toymakers used wood, tin, or cast iron to fashion horses, soldiers, wagons, and other simple toys. Charles Goodyear's method for "vulcanizing" rubber created another medium for manufacturing balls, dolls, and squeeze toys.

Toys Turn On!

In the early 1970's, Pong, the first patented video game, hit the market. Nolan Bushnell created it along with a company named Atari. Pong debuted in arcades, and soon moved on to television screens in living rooms around the world. Other games followed—Space Invaders, Pac Man, and Tron. As technology advanced, the dedicated single game machine was replaced by programmable machines that allowed different games to be played simply by exchanging a cartridge.

Inventions in circuitry and miniaturization in the early 1980's produced handheld games, as Nintendo, a Japanese electronics company, along with many others, moved into the video game market. As home computers become more accessible, video games become more versatile, action packed, challenging, and diverse.

As society has progressed, so has the complexity and diversity of our amusements. Once, toys simply reflected everyday life and activities. Today, toys create new ways of living, teach us to adapt to changing technologies, and inspire us to follow our dreams.



The Ups and Downs of Yo-Yo's

The Yo-Yo, a weapon used in South Pacific cultures, has been traced back to the ancient Greeks. First patented in 1866 by James L. Haven and Charles Hettrich, the Yo-Yo has enjoyed periods of popularity for generations with kids from 1 - 100.

Donald Duncan was the marketing genius responsible for the first American Yo-Yo fad of the 1930's. He also invented the Eskimo Pie, originated the Good Humor Ice Cream truck, and successfully marketed the first parking meter. At one time, Lego Co. used unsold Yo-Yo's as wheels on toy trucks. In 1962, the most recent period of popularity, Duncan sold 45 million of the toy.

E. F. Anderson.

Toy.

No. 92,244. Patented July 6. 1869.

Fig. 1.

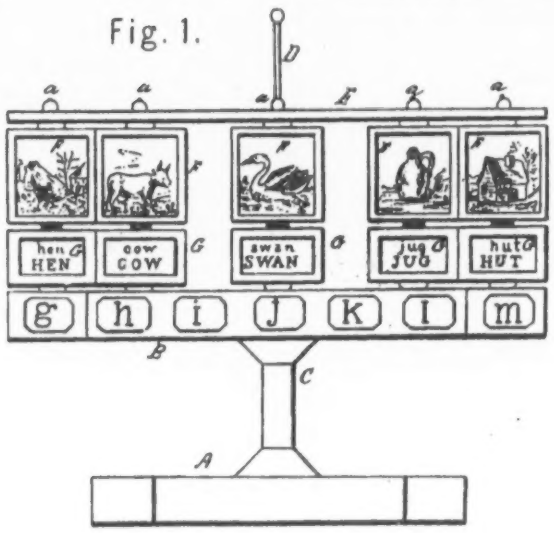
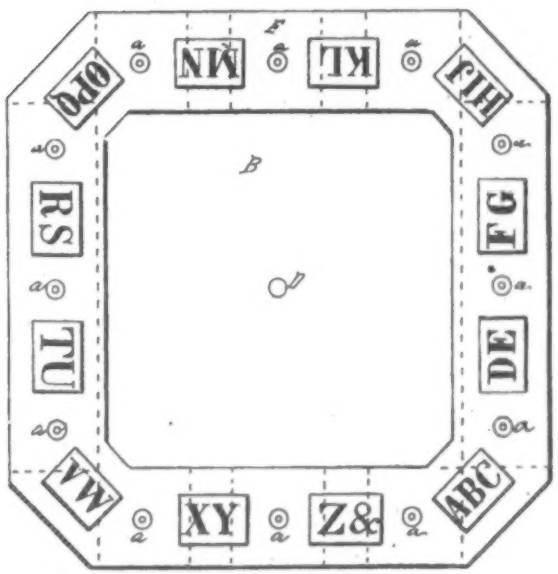


Fig. 2.



Witnesses.

J. H. Shumway

A. J. Tibbetts

Inventor.

Mrs E. F. Anderson

By her Attorney

John E. Earle

(No Model.) 2 Sheets—Sheet 1.

C. H. WESTCOTT.

TOY BUILDING BLOCK.

No. 319,764. Patented June 9, 1885.

Fig. 3.

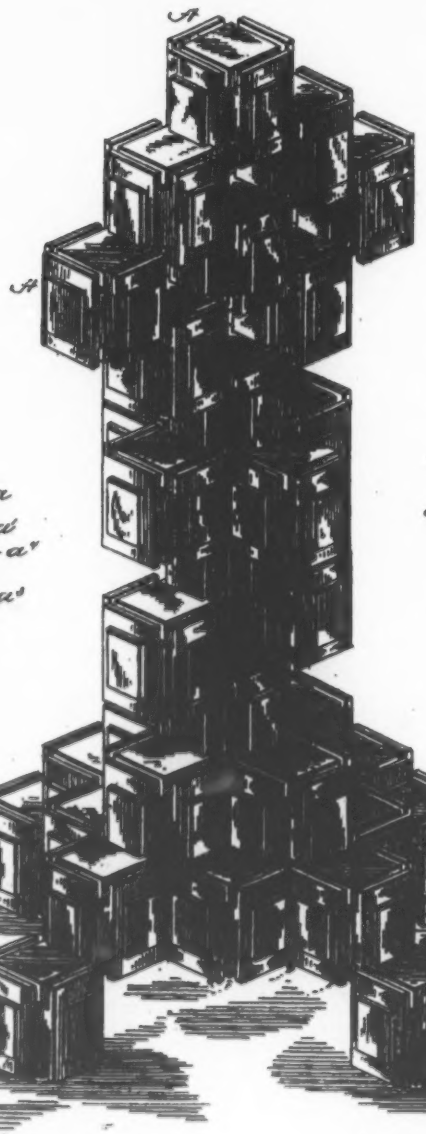


Fig. 1.

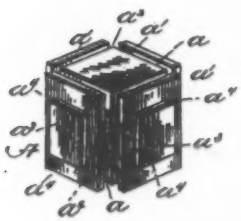
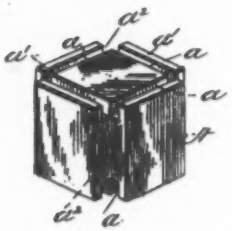


Fig. 2.



Witnesses:
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Henry C. Hazard.

Inventor:
Chas. H. Westcott, by
Prindle and Russell, his Attys.

N. PETERS, Photo-Lithographer, Washington, D. C.

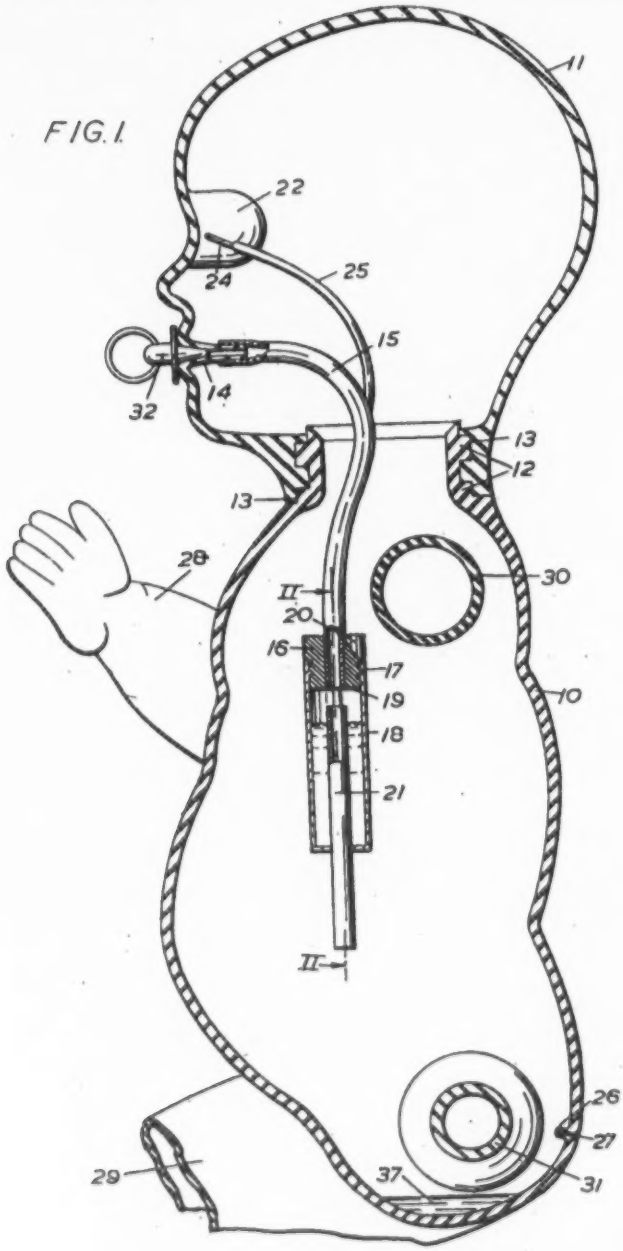
81

April 20, 1954 H. SENIOR ET AL 2,675,644

WEEPING DOLL

Filed Aug. 16, 1949 2 Sheets-Sheet 1

FIG. 1.



Inventors
Henry Senior
Jack Hensman
William T. Ward
By Jerome Clayton
Agent.

United States Patent [19]

Smith

[11] **4,230,321**

[45] **Oct. 28, 1980**

[54] **FAMILY RELATIONSHIPS CARD GAME**

[76] Inventor: **Mildred E. Smith**, 1609 Madison St., NW., Washington, D.C. 20011

[21] Appl. No.: **37,887**

[22] Filed: **May 10, 1979**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 850,396, Nov. 10, 1977, abandoned.

[51] **Int. Cl.**[3] **A63F 1/00**

[52] **U.S. Cl.** **273/308; 35/21**

[58] **Field of Search** 273/292, 303, 306, 308; 35/21

[56] **References Cited**

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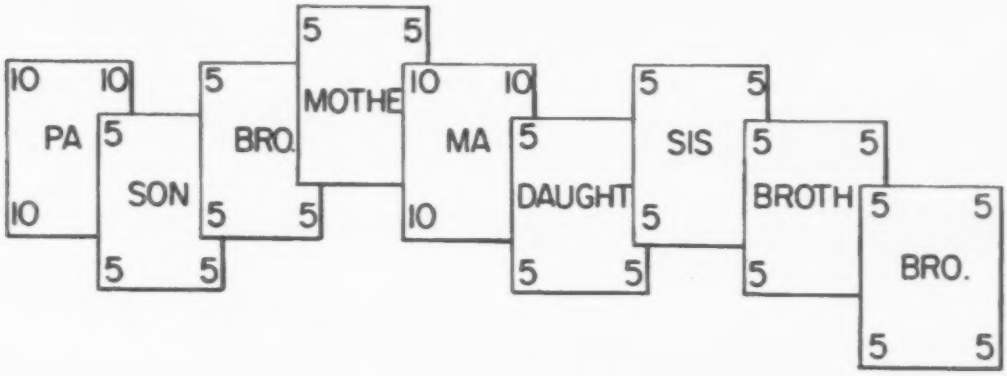
2,072,799	3/1937	Creswell	273/308

Primary Examiner—Anton O. Oechsle
Attorney, Agent, or Firm—William J. Daniel

[57] **ABSTRACT**

A card game for teaching family relationships made up of a first group of cards carrying indicia, such as a name alone or in conjunction with an appropriate illustration, corresponding to the individual members of plural, preferably three, adjacent generations of a family and including a plurality of cards for each such member; and a second group of cards carrying indicia descriptive of the relationships existing between any pair of different family members within these plural generations from the perspective of the particular player of the game and including a plurality of such cards for each such relationship for controlling during play the association of the family member cards in a predetermined pattern.

6 Claims, 3 Drawing Figures



United States Patent [19]

Bromley

[11] **4,327,915**

[45] **May 4, 1982**

[54] **DISPLAY PANEL FOR AN ELECTRONIC GAME AND METHOD OF EMPLOYING SAME**

[75] Inventor: **Eric Bromley**, West Simsbury, Conn.

[73] Assignee: **Coleco Industries, Inc.**, Hartford, Conn.

[21] Appl. No.: **158,698**

[22] Filed: **Jun. 12, 1980**

Related U.S. Application Data

[63] Continuation of Ser. No. 921,347, Jul. 3, 1978, abandoned.

[51] **Int. Cl.**³ **A63F 9/00**

[52] **U.S. Cl.** ..... **273/94**; 273/85 G; 340/323 R; 340/754; 340/782; 340/799

[58] **Field of Search** ..... 273/1 E, 1 GC, 85 G, 273/88, 93 R, 94, 313, 237, DIG. 28; 364/410; 340/323 R, 706, 768, 780, 791, 792, 800, 810, 799, 782

[56] **References Cited**

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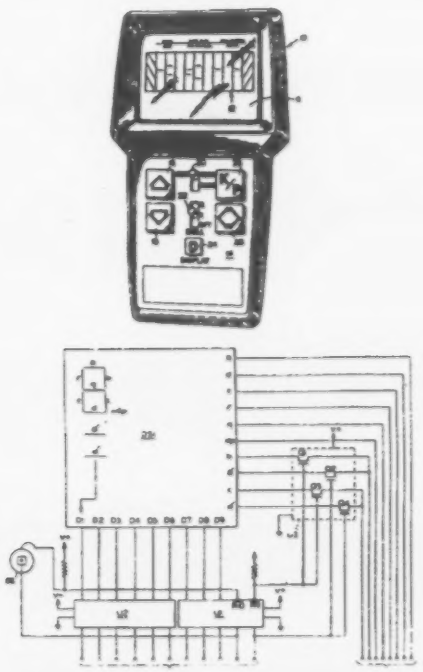
Primary Examiner—Vance Y. Hum

[57] **ABSTRACT**

An electronic simulated football game includes provision for displaying and moving a multiplicity of offensive players on a display panel that includes an array of light-emitting diodes in response to commands entered from a keyboard to an operational circuit that controls the display. The provision of more than one offensive player affords the possibility of simulating blocking and passing, provisions for which are made in the operational circuit. Additionally, the operational circuit controls the display to provide and move a symbol representing a football during passing and kicking plays. Finally, status information, such as the score and the down number, is displayed on the same part of the display panel as that on which play action is shown.

10 Claims, 17 Drawing Figures



US005184830A

United States Patent [19]

Okada et al.

[11] Patent Number: 5,184,830

[45] Date of Patent: Feb. 9, 1993

[54] **COMPACT HAND-HELD VIDEO GAME SYSTEM**

[75] Inventors: **Satoru Okada; Shin Kojo**, both of Kyoto, Japan

[73] Assignee: **Nintendo Company Limited**, Kyoto, Japan

[21] Appl. No.: **899,179**

[22] Filed: **Jun. 15, 1992**

Related U.S. Application Data

[63] Continuation of Ser. No. 462,400, Jan. 8, 1990, abandoned.

[30] **Foreign Application Priority Data**

Apr. 20, 1989 [JP] Japan 1-101028
Oct. 1, 1989 [JP] Japan 1-4452

[51] **Int. Cl.**[5] **A63F 9/22**

[52] **U.S. Cl.** ..... **273/433**; 273/434; 273/435; 273/85 G

[58] **Field of Search** ..... 273/433, 434, 435, 437, 273/85 R, 85 G, DIG. 28; 364/410

[56] **References Cited**

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8302566	8/1983	World Int. Prop. O.	273/85 G

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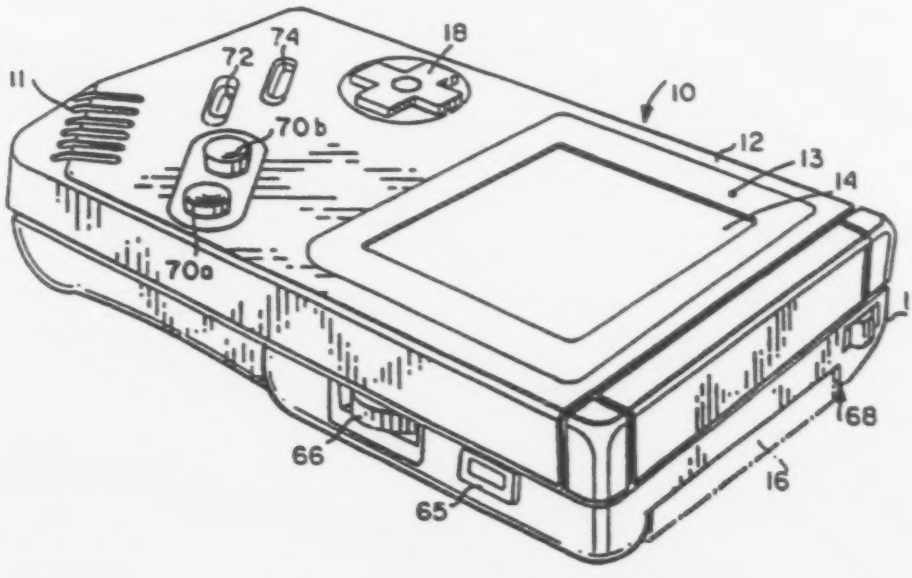
Worley, Joyce "Spitball Sparky", Electronic Games, Nov. 1984, p. 86.

Primary Examiner—Jessica J. Harrison
Attorney, Agent, or Firm—Nixon & Vanderhye

[57] **ABSTRACT**

A hand-held electronic game machine for use with attachable/detachable memory game packs wherein the game machine includes a case of a size which may be held by a hand and capable of being sandwiched by both hands with a first switch disposed at a position such that during a game it can be operated by one thumb on a front surface of the case, a second switch disposed at a position such that during a game it can be operated by the other thumb on the first surface of the case and a third operation switch means provided in a region of said front surface where imaginary loci of both thumbs intersect with each other on the front surface, and wherein the game machine can be connected with others for simultaneous multiple player competition.

21 Claims, 12 Drawing Sheets



US005397133A

United States Patent [19]

Penzias

[11] Patent Number: 5,397,133

[45] Date of Patent: Mar. 14, 1995

[54] **SYSTEM FOR PLAYING CARD GAMES REMOTELY**

[75] Inventor: **Arno A. Penzias**, Highland Park, N.J.

[73] Assignee: **AT&T Corp.**, Murray Hill, N.J.

[21] Appl. No.: **129,564**

[22] Filed: **Sep. 30, 1993**

[51] Int. Cl.[6] **A63F 9/24**; A63F 1/14

[52] U.S. Cl. ..... **273/439**; 273/148 R; 273/149 P

[58] Field of Search ..... 273/148 R, 149 R, 149 P, 273/85 CP, 439, 438; 434/128, 129

[56] **References Cited**

U.S. PATENT DOCUMENTS

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4,667,959	5/1987	Pfeiffer et al.	273/149 R

Primary Examiner—Jessica J. Harrison
Attorney, Agent, or Firm—Barry H. Freedman

[57] **ABSTRACT**

A system for playing card games remotely includes both a multimedia communication system that allows players located remotely from each other to see and hear each other, and a "card toaster" and associated image recognition system at each game site which receives and manages a physical deck of cards at every site at which the game is being played. The toaster has the capability of (1) reading cards, for example, by scanning them, (2) finding particular cards, and, if necessary, sorting them, and (3) distributing cards, such as by dealing them. The system enables the players to deal and then play a game, such as the game of bridge, in a manner which closely approximates the manner in which a game is played when all players are co-located. Thus, once play is started, the image recognition system reads the cards played on a table at any site, and transmits information regarding those cards to the other sites. At the other sites, the card toaster is signaled and arranged to distribute the same cards, face up on the table.

15 Claims, 4 Drawing Sheets

BEST COPY AVAILABLE

Rumor has it...

that a Patent Office official resigned and recommended that the Patent Office be closed because he thought that everything that could possibly be invented had already been invented!

While that statement makes good fun of predictions that do not come to pass, it is none the less just a myth. Researchers have found no evidence that any official or employee of the U.S. Patent Office had ever resigned because there was nothing left to invent. A clue to the origin of the myth may be found in Patent Office Commissioner Henry Ellsworth's 1843 report to Congress. In it he states, "The advancement of the arts, from year to year, taxes our credulity and seems to presage the arrival of that period when human improvement must end." But Commissioner Ellsworth was simply using a bit of rhetorical flourish to emphasize the growing number of patents as presented in the rest of the report. He even outlined specific areas in which he expected patent activity to increase in the future.

Taken out of context, such remarks take on a life of their own and are perpetuated in publication after publication whose authors, rather than check facts, copy and quote each other. For example, recent publications have attributed the "everything that has been invented..." quote to a later commissioner, Charles H. Duell, who held that office in 1899. Unlike Ellsworth, who may have been merely misquoted, there is absolutely no basis to support Duell's alleged statement. Just the opposite is true. Duell's 1899 report documents an increase of about 3,000 patents over the previous year, and nearly 60 times the number granted in 1837. Further, Duell quotes President McKinley's annual message saying, "Our future progress and prosperity depend upon our ability to equal, if not surpass, other nations in the enlargement and advance of science, industry and commerce. To invention we must turn as one of the most powerful aids to the accomplishment of such a result." Duell adds, "May not our inventors hopefully look to the Fifty-sixth Congress for aid and effectual encouragement in improving the American patent system?" These are unlikely words of someone who thinks that everything has been invented.

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